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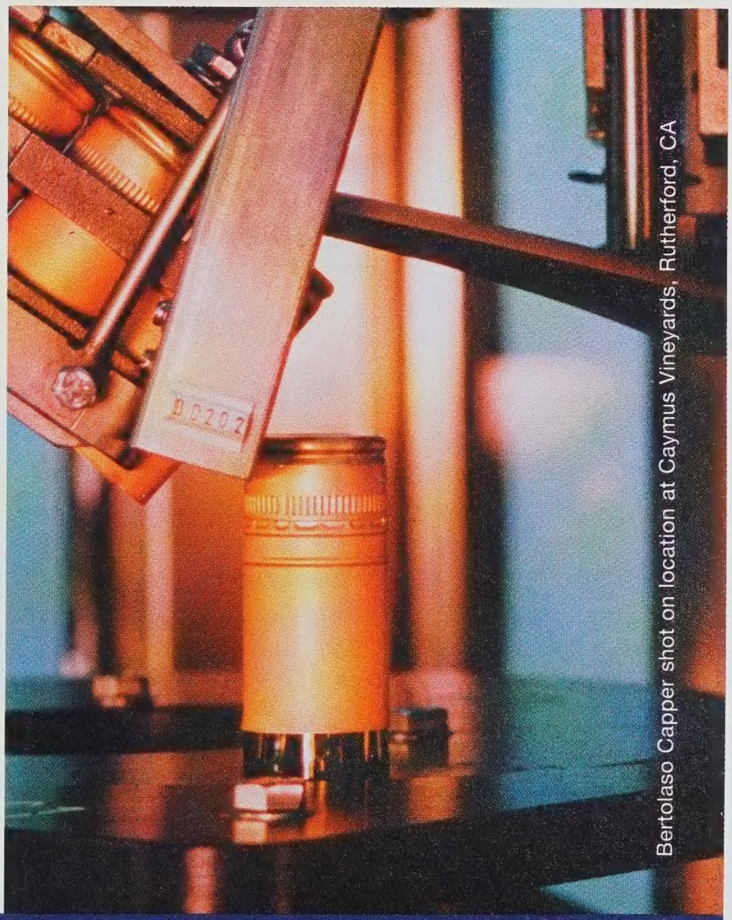

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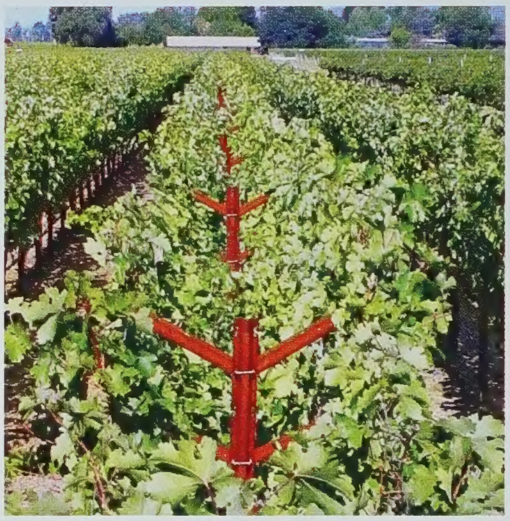

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*"To stimulate continuing improvement in the wine industry."*

# CORO MENDOCINO

# Small but growing classic CONSORZIO

**Kazmet Vineyard, in the southwestern benchlands of Redwood Valley (Mendocino County), supplies Zinfandel to Graziano Winery's Coro Mendocino blend. The 40-year-old head-pruned vines are spaced 10x8. Photo by Mark Adams.**

**BY Millie Howie**

Eight Mendocino County winemakers sat down together in 2000 to conceive a class of distinctive wines to showcase the rich wine-producing heritage and special qualities of Mendocino County's earth, sun, and soil.

They introduced Coro Mendocino. Coro, which comes from the Latin, may mean either "chorus" or "from many into one." Either is appropriate nomenclature for this new category of wines in which each winery creates an individual blend based on a specific protocol.

This is the first time in U.S. history that winemakers from a region have set parameters for a wine distinctive to that single region, made with specific grape varieties by specific methods, defining a target amount of alcohol, final pH, and TA.

The eight original members of Coro Mendocino were Brutocao Cellars, Eaglepoint Ranch, Fetzer Vineyards, Gabrielli Winery, Golden Vineyards, Graziano Family of Wines, Pacific Star Winery, and Parducci Wine Estate. By 2006, when the 2003 Coro Mendocino vintage was released, the founding members were joined by Dunnewood Vineyards, McDowell Valley Vineyards, McNab Ridge Winery, and Oracle Oaks Winery.

In nearly every major winegrape growing region of the world similar bands of grapegrowers and winemakers have formed growers' associations (consorzios) to define their classic growing zone, establish quality controls, and oversee production of a specific wine category. The members of these groups, most noticeably Chianti Classico in Italy, grant members following these protocols the right to display the logo of the consorzio on their labels and in marketing materials.

In determining criteria for production of Coro Mendocino wines, the proviso that Coro wines be based exclusively on Mendocino-grown fruit was the first stipulation followed by the restriction that the wine, must have a core of between 40% and 70% Zinfandel. The choice of Zinfandel was based on the presence of 1,000 acres of Zinfandel flourishing within the Mendocino AVA and that it grows well in a variety of Mendocino County locations, with various soil types and climate influences.

Second-tier varietals in the Coro blend are: Barbera, Carignane, Charbono, Dolcetto, Grenache, Syrah, Petite Sirah, Primitivo, Sangiovese, and Syrah. Up to 10% is allowed from any single or combination of vinifera grapes such as Cabernet Sauvignon, Pinot Noir, Semillon, or Tinta Cao.

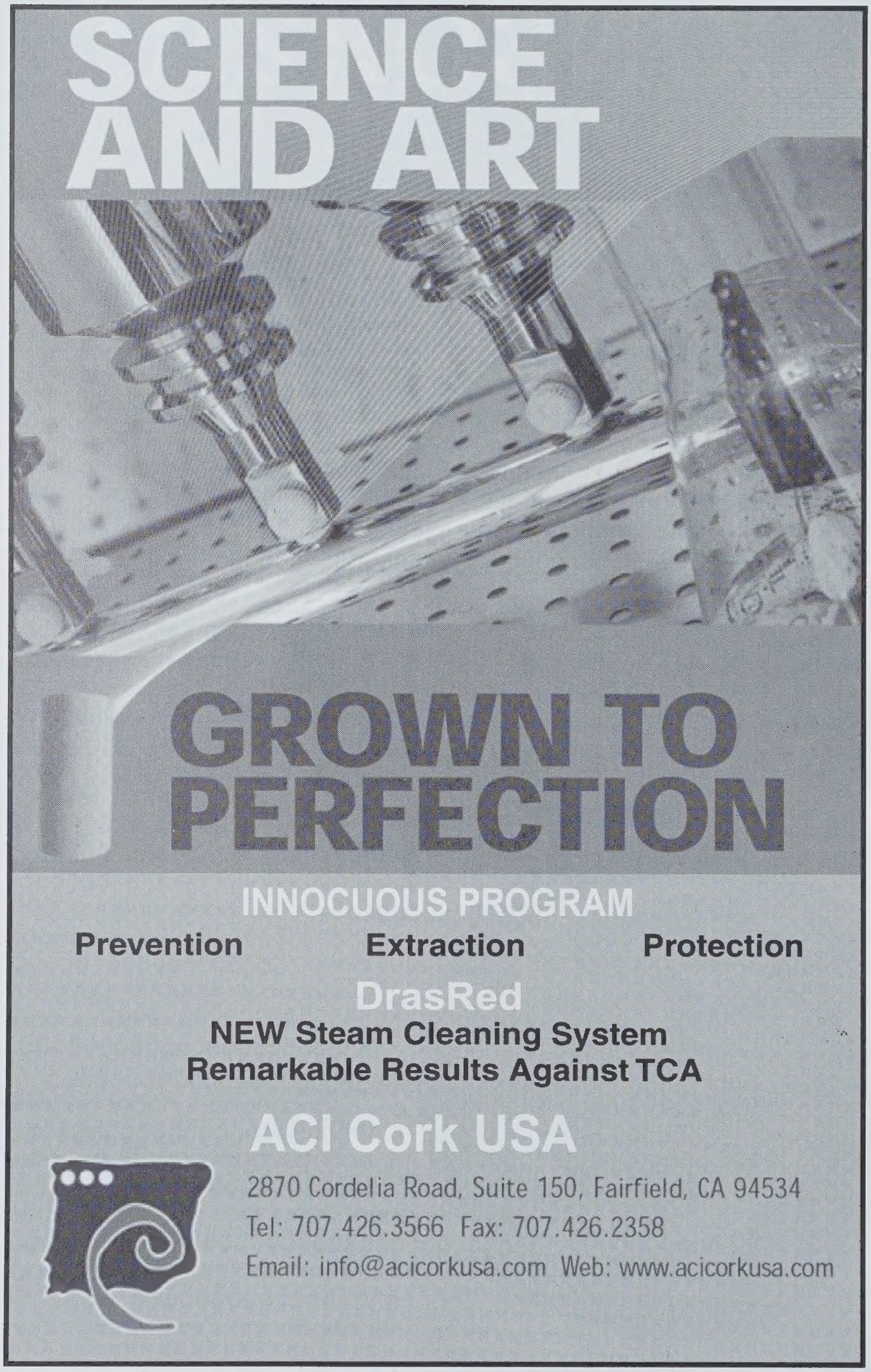
Each Coro Mendocino wine must be produced at a Mendocino County bonded winery with the following limitations of alcohol content (between 12.5% and 16%), 3.2 to 3.8 pH, and 0.4 to 0.9 g/100ml TA. The wine must be aged for at least 18 months in barrel, and one year in bottle before release. Cooperage is a minimum of 25% to a maximum of 75% new wood.

Each winery creates its own blend based on the protocol, and each wine is reviewed by a panel of five winemakers in four blind tastings before the wine is accepted for Coro Mendocino labeling. Following final review and acceptance, the winery is issued a certification number for that specific wine and vintage. Each wine is presented in a uniform bottle, with a common Coro Mendocino label which may be personalized by the individual winery. The suggested California retail price for the 750ml bottle of Coro Mendocino wine is $35.

Three founding Coro Mendocino members shared the tasks they faced in formalizing a baseline production covenant governing everything about Coro Mendocino from grape sources to marketing.

### Coro package

"The hardest part," recalls Greg Graziano, Graziano Family Wines (Redwood Valley, CA), "was developing a label design that would present the image we wanted. We have had time to assess the reception of the wines, and we know we made a good choice."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"After the members of Coro Mendocino had set the parameters and protocol, I was asked to present some ideas for a logo," recalls Rick Roese, Brown-Forman graphics artist. "It was a communal effort and the early discussions were very interesting since we were trying to come up with a common label that would allow for individual name branding.

"We wanted something that emphasized the concept of a chorus of various voices joining in the same melody. We also wanted to deliver the message, 'We have a long history, and good things are happening.' This we achieved by starting with an outline of the county boundaries and utilizing earth tones and a note of old world elegance, suitable for identifying a high-end wine.

"Each winery bottles individually, in antique green, tapered, push-up claret bottles. The pressure-sensitive labels are printed digitally by W.S. Packaging, with capsules supplied by Ramondin USA. The metallic seal is made in France and supplied by Phoenix Packaging in St. Laurent, Quebec."

### Marketing

"Coro has been a great personal and winemaking experience for me," says Graziano. "I have learned a great deal about blending and cooperating with others to create a truly unique and high-quality product. To my knowledge, Coro has brought as much positive press to Mendocino County as any countywide wine project. It has been for us, the easiest $35 bottle of wine to sell in our history."

Fetzer and Graziano are the largest producers; Fetzer bottling just over 500 cases of 2004, the fourth year since the birth of Coro, while Graziano bottled 400 of 2004 and will release 500 cases of 2005. Because production is very limited, there is not enough Coro Mendocino to cover such large (and important) markets as San Francisco and Los Angeles.

## This wine was made for you and me

(Based on "This Land is Your Land")
By John Mattern

From the coastal redwoods, to the inland valleys,
The highland vineyards, to the grape bin tallies.
From fermenting barrels, to the final blending,
This wine was made for you and me.

Coro Mendocino, Coro Mendocino,
Coro Mendocino, Coro Mendocino,
Coro Mendocino, Coro Mendocino,
This wine was made for you and me.

As grapes were ripening, winemakers were inside.
They saw potential, they found a new pride.
They rambled and wrote down, the Coro Wine Guide.
This wine was made for you and me.

Coro Mendocino, Coro Mendocino,
Coro Mendocino, Coro Mendocino,
Coro Mendocino, Coro Mendocino,
This wine was made for you and me.

When asked who the target market is, Graziano answers matter-of-factly: "Anyone who is willing to take the wine," then cites his dining experience in a restaurant on a recent trip to Japan. "When the staff discovered the man who had made the Coro Mendocino, that was on their wine list for $150 per bottle, was in their restaurant, the entire staff came by to shake my hand, and then a glass of Coro appeared at my table, a gift from some ladies seated some tables away. This experience showed me that restaurateurs are not afraid to try this entirely new concept in winemaking."

Even though the aim of each winery is to produce 100 more cases of Coro each year, the quantities available to consumers are still so small that each vintage sells out long before the next is ready to send to market. The approach by Dennis Patton, Fetzer Vineyards winemaker (Hopland, CA), was to see that the winery's key accounts received an allotment of Coro.

"We are doing no advertising and we are all aware that growth will be slow, but what we are doing is unique in the U.S.," explains Patton. "By utilizing so many choices of little-known varieties in our blend, we are adding dimensions never explored before and we can see the progress we are making. Even though Coro is only four vintages old, we can already see that, although our plans are to make wines that are drinkable on release, these are wines that are probably going to live longer than we anticipated."

### *Grape sourcing*

In selecting the Fetzer second-tier grape varieties, Patton seeks exceptional sources for the wine. "Fetzer would like to be able to use all organic fruit in the blend, and the older the vines, the better. Now we take certain lots into the barrels from which we

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anticipate drawing wine for our final Coro blend, incorporating some of the techniques used in producing similar wines in France. I am looking for toasty, smoky aromatics and this leads me to use French oak barrels with toasted heads.

"This wine is about consistency — year in, year out. We can use different blends just so long as we maintain the quality. These wines are the antithesis of what some winemakers refer to as 4x4 wines — 4 pH and 4 TA. That is not what Coro is about. People say, 'Oh, you guys just came in and made your own rules.' We reply, if you want changes in the protocol, then join the group and we'll discuss the changes you want."

The core Zinfandel grapes for the Coro wines are drawn from many sources, but most of the grapes come from dry-farmed, head-trained vines at least 35 years old.

For the first Coro Mendocino vintages, Bob Swain, winemaker at Parducci Wine Estate (Ukiah, CA), notes that the focus was on blending. "To make the Coro blend there was the issue of balance. Before you go into the blending session you must have an idea of the balance you are hoping to achieve."

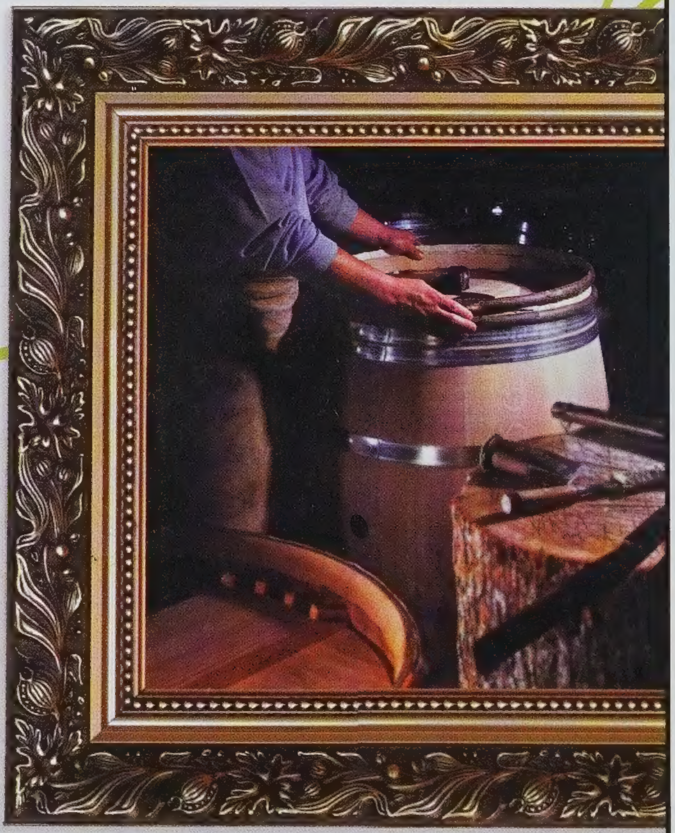
Parducci Coro wines (2001, 2002, 2003, 2004) rely on just three grape varieties — Zinfandel, Petite Sirah, and Syrah. Swain reinforces this emphasis by adding, "I don't go with numbers. I go with the taste. The fruit that tastes the best and fits into the blend best will always be my choice. A great deal of what the grapes offer is dependent on the vineyards and whether the vines are trellised or head-pruned.

"For the 2003 blend we drew from six different vineyards, none of them, individually, yielding more than six tons per acre. One vineyard yields about 1.5 tons per acre (TPA). I'm looking at windows of variance for the different varieties in the blend."

"The growing year has a great influence on what both the numbers and the flavors will add to a blend," adds Patton. "For a wine like Coro, you have to think ahead to what each element is going to contribute. You have to take into consideration that you are not only working with unique varieties, but with specific sites.

"Some individual Coro wines have very small amounts of some varieties. In the Fetzer 2002 Coro there were special lots brought in from a great many vineyard sites and nine varieties ended up in the blend. There were 12 different fermentation lots as small as two to four tons. By 2003, with the experience we had gained, we were narrowing down the choices.

"In meeting the standards of the protocol, you are looking at a moving target. You know what challenge each variety is going to present before the wine is blended. Zinfandel can be high alcohol (in the 15% range), with a low



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pH of 3.2 or 3.3. It is harder to get pH and acidity right than alcohol although you have to stay below that 15% range, because in some states it is illegal to sell wine with alcohol above 15%.

"Now, after four years, I know some of the components I am going to use. I will choose fruit from several select vineyards. The yields may range from 1.5 TPA to five or six TPA. With Zinfandel, I need some fruit that arrives at the winery with a higher pH (3.7 or 3.8) to balance with the jammy Zinfandel from Redwood Valley that has a lower pH. Petite Sirah that crops out at 1.5 to two TPA and comes to the winery at 3.4 or 3.5 adds structure. Syrah, with a slightly higher pH is more meaty.

"In a large winery, you have a good library of wines to use in the Coro blend," says Swain. "I can do small lots from one to 50 tons from select vineyards. As an example, for the 2003 Zinfandel core blend, I used grapes from Tony Milani's vineyard that are dry-farmed, head-pruned, with low pH, and high acid."

### *Winemaking*

All three winemakers are pretty much in agreement on winemaking techniques. Most acidify once or twice — first at the crusher and again at bottling, every year. Most agree that the pH of all the wines in the blend should be below 3.7. The final blend is made within 30 days of bottling, so they can retain all options as long as possible.

Oak influence for all three Coro blends starts with 30% to 50% new oak.

"The Fetzer wine," Patton says, "has 30% new barrels, approximately 30% one- and two-year-old barrels, and the remainder neutral barrels (four to eight-years-old). Most are French oak, but not all, since we like American barrels on the Zinfandel fraction. We use a slightly higher than medium toast level."

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## Coro Mendocino

(based on "Folsom Prison Blues")
By Casey Hartlip, Eagle Point Ranch

We saw the trend a comin',
it's all about the blend,
this wine shows off its heritage,
from way back when.

It's Coro Men-do-cino,
this wine is here to stay,
and I'm here to tell this story,
across the U-S-A.

When I was just a baby,
my mama told me son,
"go out and plant good Zinfandel,
'cause Cabernet ain't the one!"

But I drank some up in Reno,
that wine just made me cry,
If you try yourself some Coro,
it'll make your spirits fly!

I know there's farmers workin'
in those vineyards near and far,
they want those grapes in Coro,
they want to raise the bar!

It's been a long time comin',
this wine'll set-you-free,
So here's a toast to Coro,
I hope you will join me!

You know this blending thing is special,
the panel MUST approve the wine,
if your juice doesn't cut it,
it will get kicked on down the line.

It's Coro Men-do-cino,
this wine is here-to-stay,
so get out and buy some Coro,
across the U-S-A!!!!!

At Parducci, Swain uses 30% new barrels with the balance neutral. "We use a mix of cooperages," Swain explains, "34% American, 61% French, and 5% Hungarian. No one influence predominates."

"Coro gives us a great opportunity of flexibility in blending to achieve consistency and balance with more complexity due to longer time in barrel and bottle prior to release," explains Graziano. "We use 50% new heavy toast, thick stave French oak Burgundy-shape barrels with toasted heads from the Vosge forest made by several Burgundian coopers."

Yield at harvest is generally less than three TPA. Fermenting must is inoculated with a yeast such as Asmanshausen, 20-56, L226, or Pasteur red. Most of the lots are fermented in two-ton fermentors, with the cap punched down, or in five-ton fermentors punched down and pumped over. All malolactic fermentation is accomplished with natural bacteria in barrel.

"I usually give Zinfandel a cold soak for 72 hours at about 60°F, more to decide what I have and what the sugars are," explains Swain. "I've been doing this for several years with Zinfandel. For other varieties, the cold soak is probably 48 hours. Some of the varieties come in so cold you can't get them warm."

"Harvest usually takes from nine to 10 weeks, which is a much broader window than most regions," says Patton. At harvest, he looks for minimum raisining. "I want ripe fruit, not baked sugar," he adds. "In Mendocino County, most Zinfandel is drip-irrigated so raisining is not usually a problem."

In producing all four vintages of the Fetzer Coro wines Patton's varietal choices were Zinfandel, Syrah, Petite Sirah, and Gernache. In describing the procedure he followed for creating his 2004 Coro blend Patton says, "All the wines that went into the 2004 blend were made in no larger than four-ton lots. Most were fermented in one-ton bins and manually punched down. They were pressed off in a basket press and went to barrel after post fermentation residue had settled.

"They all underwent malolactic fermentation in barrel, most not finishing until nearly spring. All wines were in barrel for 18 months. Our choice of which oak to use varies, although we are committed to the use of oak, usually choosing new to three-year-old wood."

### Blending

The final blend is usually made three months before bottling. "By then," Patton explains, "I can put together the blend with components I am sure I am going to use. The decision will be guided by the condition of the fruit, size of the tank, and whether I have punched down or pumped over during primary fermentation."

"The difficulty when you're blending Coro is that your wine is being reviewed by people outside your in-house tasting panel," notes Swain. "I do most of my blending by myself, and don't often have the chance to get feedback about a blend from a group of winemakers. It's a unique opportunity, and one you don't often experience. It is more open-ended with less dependence on judging each individual variety alone.

"It gives us a totally different perspective from what many California winemakers experience. With this protocol, the wine is meant to be over bottle shock and ready for consumption in about three months, but what we are sure we are seeing is that the Coro wines have an excellent potential for ageing. It will be interesting to do a vertical tasting in a few years."

"Zinfandel from three or four vineyards [each year] is approximately 55% to 60% of each vintage bottling," reports Graziano. "Petite Sirah, in the last three years, is 10% to 15% of the blend. Barbera, Dolcetto, and Sangiovese will each be 5% to 10% of the blend. All of the varieties have yielded three to four tons/acre every year."

### Coro evolution

What the winemakers producing Coro wines are enjoying is the evolution of the process. "You learn going through," says Swain. "You're impressed with the difference between the 2001 vintage and those that follow. For the first vintage, we had to go into our cellars to find some of the second tier and minor varieties.

"Now we have identified vineyard sources that give us grapes with the qualities we need to meet the mission of the Consortium Mendocino: to increase the awareness and value of Mendocino wine and winegrape products through the production of Coro Mendocino, a controlled, ultra-premium blended wine that reflects the quality and commitment of the Mendocino County wine industry." ■

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## HUDSON VINEYARDS

# Custom farming yields high quality grapes

**BY Jack Heeger**

Winegrape growers take pride when their grapes are made into award-winning wines and when their vineyards win awards for viticultural practices. Lee Hudson (owner) and vineyard manager, Jason Kesner, of Hudson Vineyards in the Carneros region of Napa County, are very proud to have achieved both honors.

Hudson farms 145 acres, growing eight different grape varieties in 64 individual blocks, and sells them to nearly 30 California North Coast wineries, many of which consistently receive scores in the 90s from wine critics. Several of them use Hudson Vineyards as a vineyard-designation on their labels.

Those wine scores are valued by Hudson because they reflect the high quality of the grapes, but the plaudits given for viticulture practices seem to please him more.

Hudson Vineyards recently received an Integrated Pest Management Innovator Award from the California Department of Pesticide Regulation for promoting sustainable farming practices that benefit the environment and reduce the need for pest control.

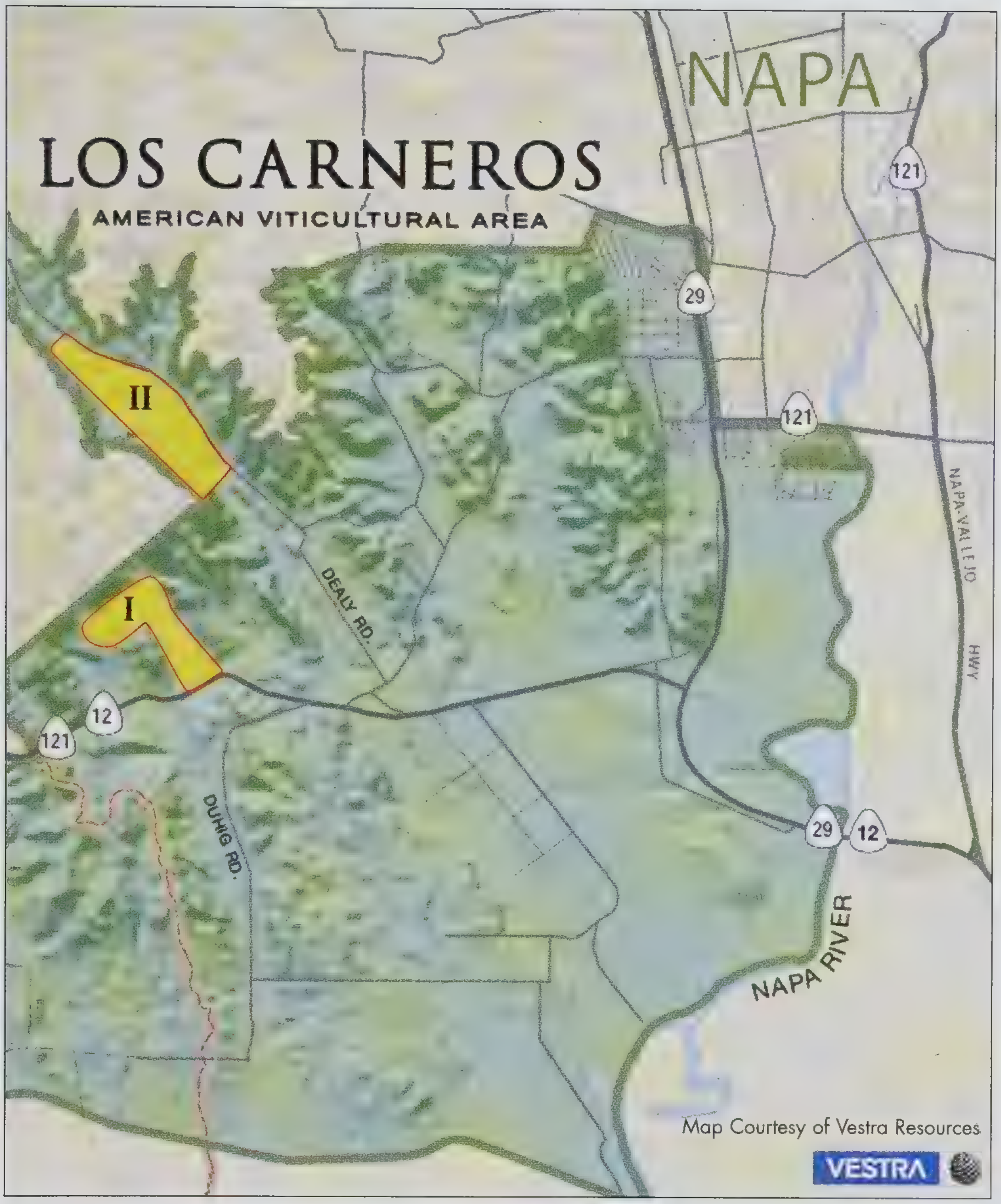
In 25 years of focusing on growing quality wine grapes, it has become clear to Hudson that a focus on quality is best coupled with sustainability. He adds that pest control is a major part of sustainability.

Ironically, sometimes sustainability efforts can actually encourage certain types of pests. "Permanent cover is a friend of voles," Hudson cites as one example. "We don't remove prunings, but chip them up and leave them in the vineyard. This builds up and becomes optimal vole country, and voles will kill some vines. There are voles in some areas and not in others. We look at the mulching in some areas. We may try to disk some rows to see if we can cut down on voles. We're trying sulfur bombs to see if they work. "

Jason Kesner adds, "We are using sulfur bombs on gophers. We stopped

**The "Harvest Flags" of Hudson Vineyard. Jason Kesner notes, "During harvest, we fly the Mexican flag in honor of our workforce. We also hoist the Jolly Roger. All bets are off during harvest. It's mayhem. It puts us in the mood to work 16-hour days."**

**Hudson Vineyards owner Lee Hudson (right) and vineyard manager Jason Kesner. Photo by John McJunkin**



**Hudson Vineyards: Home Ranch (I), Henry Road Ranch (II)**

poisoning gophers and voles six years ago, because there are no good baits on the market. If you use poison on gophers and voles, and the owls and hawks eat them, it builds up in those birds and will kill them. Sulfur bombs are fun to use, like big firecrackers."

Hudson Vineyards places considerable emphasis on owls, because of their effectiveness against pocket gophers, though they are less effective with voles. "The vineyard has about two dozen owl boxes," Kesner says. "There are more owls than boxes, and at least 50 barn owls live on the property. We see piles of pocket gopher mandibles under the owl boxes. There's a large food source for them here."

"The pest population varies from year to year, " Hudson says,"and that means there are variations in the pressures that pests put on the vineyard."

For example, leaf hoppers were not a problem during 2006; neither were mites. "We are watching one block for mites," Kesner says. "It is easy for mites to reach an economic threshold that threatens the viability of the crop. We sprayed that block with Acramite, which is very target-specific. Unlike other mite treatments, you can re-enter the vineyard in 12 hours after Acramite application."

Pierce's disease has not posed much of a problem so far. "We have a relatively low population of Pierce's disease, and I have never seen a bluegreen

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sharpshooter at our newer Henry Road ranch," says Hudson.

Kesner offers a warning: "We might see some sharpshooters appear in the next 10 years. The Henry Road Ranch was a large cattle ranch from the 1930s or early 1940s up until the 1970s. At that time, the property did not have the habitat for sharpshooters, but if you go there now, you will see two generations of habitat growth."

Some areas with clay soil develop thrip problems. "We use Stylet-oil early in the season, which acts as a smothering agent and works against thrips and mildew," Hudson says. "We get it in organic formulation, and it has become a useful tool for us."

### Weed control

Hudson Vineyards uses four mechanical tools to control weeds — shovels, an in-and-out row tiller, hoe plows, and a Clemens weed control device — and they are all often used in conjunction with each other.

"We use the Clemens on a small portion of the ranch," Kesner says. "Most of the acreage is treated with a hoe plow, then an in-and-out tiller, which we have been using only for the last couple of years. With any mechanical method, there's always a certain amount of shovel work, but we want to use shovels as little as possible."

Not only do they rotate the implements; they also rotate herbicides in reaction to what they see in the vineyards. "We haven't used herbicides in some blocks for seven years," says Hudson. He defends the use of herbi-

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cides, "To not use herbicides anywhere on the ranch is not being sustainable."

They try to keep tractor use to a minimum. "Going through with a tractor uses more fuel and it compacts the soil," Kesner says. But even so, "We make two mechanical weed control passes per year."

Cover crops include a variety of mixes. "We're experimenting with some mixes in Block 2 to see what works," Kesner says. "For the last two years, we've been seeding every fourth row with insectory mixes to attract lacewings and ladybugs by giving them food sources. We find that, if we can stay away from chemicals, the native approach works just fine."

The usual cover crop mix is peas, beans, barley, and vetch. "We are looking for a better cover crop for the lower ranch because of the heavier clays there, where the traditional beans/peas mix does not seem to work very well," Kesner explains. "We no longer seed beans on the lower ranch and have replaced them with vetch. We use short rye in areas where we don't want a permanent cover. It's inexpensive seed, does a great job, and then is disked in. We'd like to use native grasses, but it's not practical. Everything in Carneros is introduced European grasses.

"We try not to leave any permanent cover in any row for too long. The rotation is four years. We green-manure each tractor-row the first year, then disk it in. The second year we manure it, lime it, and plant cover crop. We keep the cover crop in place for four years, then switch."

There has been a major change in use of compost recently. Previously, they obtained turkey manure from a large turkey farm in nearby Sonoma County. "We used to get 40 truckloads of it," Hudson recalls. "All we had to do was wet it and spread it. But the turkey operation moved to West Virginia because it was just too tough to do business in California, with the high workers comp insurance and other taxes," he explains.

In keeping with the sustainability goal, Hudson Vineyards turned to another source for compost last year. "We purchased compost made from restaurant food scraps," Kesner says. "In the past, we've used yard waste from the local recycling company, but we were worried about the introduction of weed seed, and were concerned about the pesticides people tend to use on their lawns and shrubs and roses."

Hudson was also concerned about the fuel necessary to haul compost to the vineyards. "We try to figure out how much energy we are using when we get the compost," Kesner adds. "The trucks bringing it in use energy that could be used in a more efficient manner."

The same reasoning applied when they decided not to use pomace for compost. "None of the wineries we could work with are close enough to us to bring pomace back efficiently or economically."

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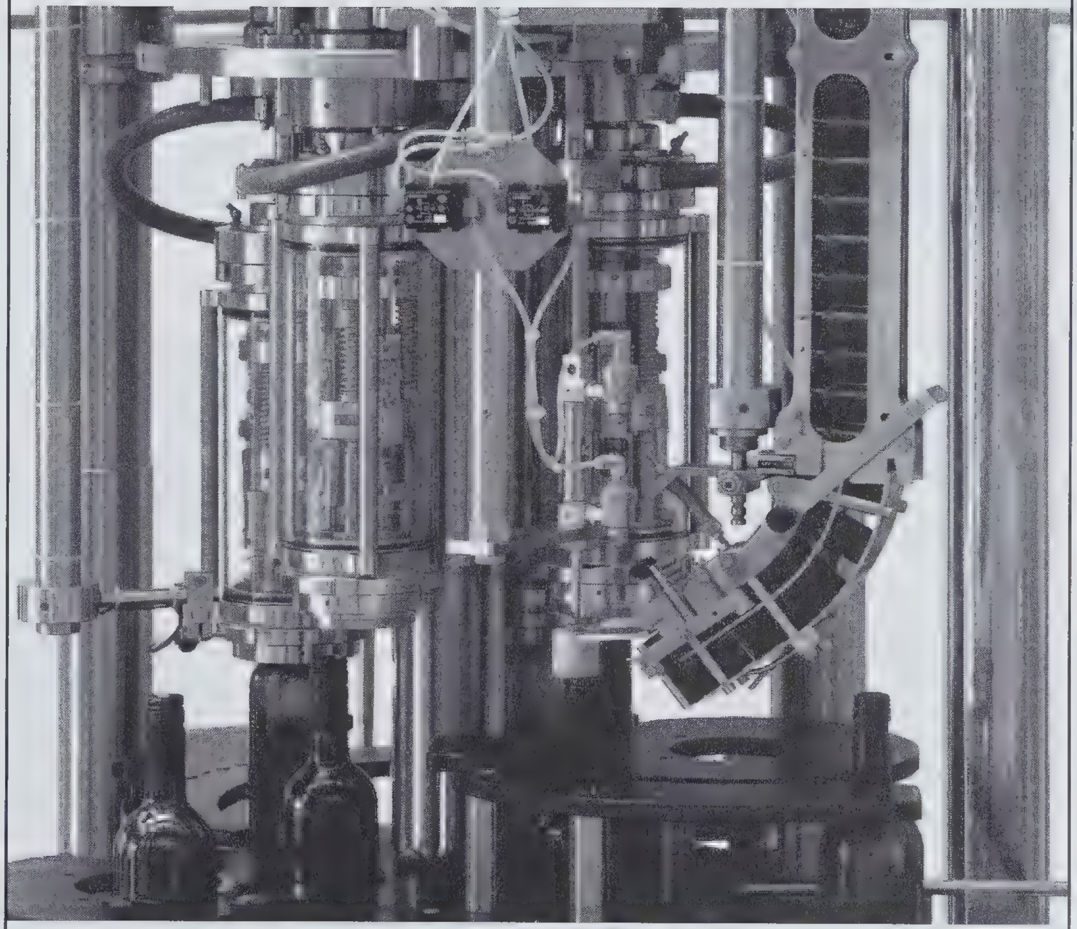

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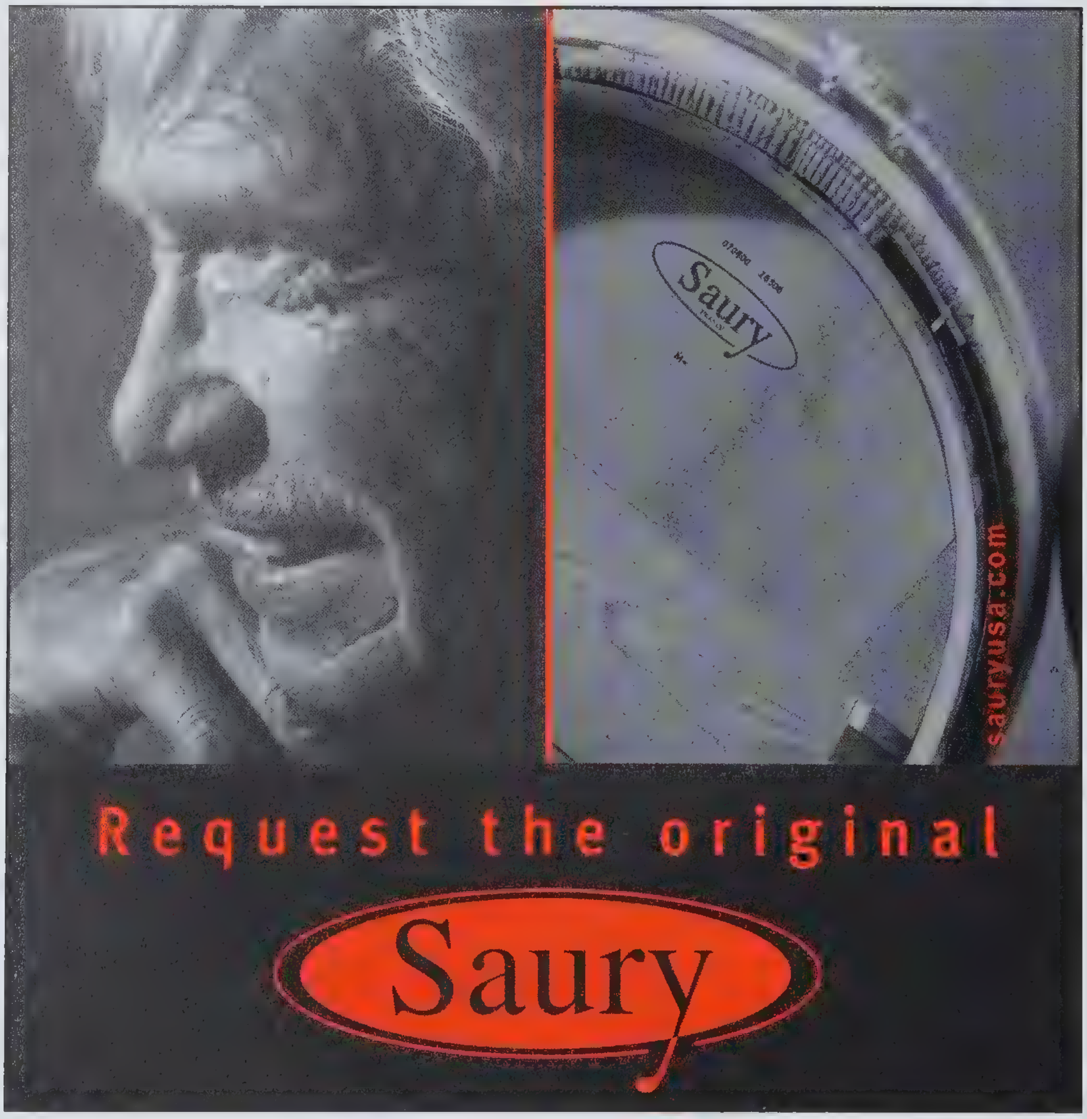

Hudson and Kesner would like to get back to using manure, and Kesner reports they are looking into establishing a relationship with a nearby dairy farm.

### *Healthy soil*

Kesner is constantly trying to achieve a balance of nutrients and soil health, porosity and overall soil tilth, that is self-sustaining and needs few additions. "We look for a balance of organic material and achieve this through green manure, cover crops, and compost," he says. "We look for soil tilth and the workability of the soil. Will it hold air? Some blocks have no water-holding capacity, so we add compost to help with drainage."

"The closer we can get to good soil health, the less susceptible the vines will be to disease. There's an old expression 'eat your fruits and vegetables, or at least take your vitamins.' That is what we're trying to do for our grapevines. Good vineyard health requires a well-balanced diet, and we are trying to feed the vines well, instead of propping them up with vitamins in the form of excessive fertilizers, etc. But we are not above taking vitamins when and where needed."

Kesner notes that two to four gallons of food-grade potassium are applied per acre through the drip irrigation system immediately after harvest as part of that diet.

### *Environment and sustainability*

Hudson looks at sustainability in every aspect of the environment. When establishing windrows, he says, "We must have planted 1,000 oaks. We collect seeds every year and plant them."

But windrows have cut into production acreage. "As we replant vineyards, especially in vigorous locations, we tend to move back from the boundaries," he says. "When we first started, we planted to the drip line of trees. But those vines did not produce, so now we go back as far as 10 to 20 feet from the drip line."

As a result, Kesner adds, "Every block we have re-planted, we've reduced the number of vines by 10%."

Sustainability is even considered in row orientation. "We try to avoid short rows, which means fewer tractor turns and less lost spray," Hudson observes. Kesner adds that, on most applications

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# Protect your brand, and honor the site

BY Lee Hudson

Hudson Vineyards, established in 1981, covers approximately 160 acres with 32 distinct vineyard sites, all custom-farmed for 31 wineries, 13 of which use "Hudson Vineyards" as a wine label designation.

Technically, "Hudson Vineyards" is a vineyard designation, but I view it more as a vineyard brand representing a distinct management style implemented over multiple vineyard sites. This branding is essential to my success as a grower.

To protect my brand, I trademarked it in the mid 1990s. By definition, a trademark is "a symbol or device used by a business to distinguish its goods or services from those of others."

I went a step further. To control the name "Hudson Vineyards," I decided to license the use of the name, essential in protecting my most important intangible asset — my reputation — and only those clients holding a license can use "Hudson Vineyards" on their labels.

The license includes:

1. a term tied to a grape-purchase contract;
2. a specific site from which the grapes originate;
3. a minimum 95% content requirement;
4. a fee; and
5. a wine-quality standard allowing for wine review.

I see a discrepancy between my interpretation of "vineyard designation," as the classic European model of wines made from a singular site, and the Alcohol and Tobacco Tax and Trade Bureau (TTB) definition.

The TTB regulations state that: "A brand name that includes a vineyard, orchard, farm or ranch name is acceptable … provided not less than 95% of the volume of the wine is derived from the commodity used to make the wine grown in the vineyard, orchard, farm or ranch named in the brand name."

The wording is a bit convoluted, but it allows a wide range of "vineyard-designated wines," some of which could be ranch- or vineyard-blended wines that could come from non-contiguous parcels sharing only a common name.

I believe vineyard designations are a relatively small subset of a vineyard defined by soil, exposure, and other conditions that produce site-driven wines. These wines can be one of the zeniths of ultra-premium wine. The appellation of origin is based on the uniqueness of site and its most refined expression is non-blended site-specific wines. When buying a vineyard-designated wine, the wine consumer can expect a substantive degree of site specificity.

Vineyard designation, an honored tribute to the diversity of the land, risks being devalued much like the term "reserve," due to this discrepancy between consumers' perception and the legal definition.

Is government regulation needed to clear up this confusion in vineyard designation? Perhaps, but that will require consensus and considerable time.

In the interim, individuals wishing to vineyard-designate should develop their own criteria and should control how their vineyard name is to be used. It is essential to my reputation that wines labeled "Hudson Vineyards" are produced from unique sites that consistently produce wines of distinctive varietal character. This does not mean that they are necessarily better wines, but they express the character of the site.

To do this I have developed some general requirements regarding use of the "Hudson Vineyards" designation:

1. A grower and winery have a seasoned relationship.
2. The winery has made wine from the site for several years.
3. The site has demonstrated unique viticultural and wine characters.
4. A long-term contract is established for continuity.
5. The winery is licensed to the site.
6. Confidence that the winery will declassify the wine if necessary.

There are two designations coming from Hudson Vineyards:

1. licensed vineyard-designated wines stating "Hudson Vineyards" and designating a specific site; and
2. licensed vineyard-designated wines stating "Hudson Vineyards" with no site specified.

Remaining clients are unlicensed and the wine ends up in a Carneros appellation blend.

The demand for vineyard designation has increased dramatically, but sites deserving vineyard designation are limited. The value of vineyard designation is determined by the uniqueness of a particular site, its management, and in turn, its vinification, done without compromise. To maintain the value of a vineyard designation and for the consumer, these principals should not be violated; adhering to this is a tribute to the land. ■

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on the lower portion of the ranch, a tractor can drive straight down a row, through a series of blocks, and through the entire vineyard, all in one pass.

"One of the big environmental problems is diesel emissions," Kesner continues,"and we want to reduce emissions. It behooves growers to start looking at alternative fuels and maybe consider introducing biodiesel. It is irresponsible of growers not to be cognizant of diesel emissions. Reducing emissions would be taking the idea of sustainability on our ranch and tying it to our neighbor's ranch, to the watershed, and to the entire region."

Environmental concerns are not only considered in determining row orientation, however. "Continuity, ease, and logic dictate orientation," Hudson says. "We're not concerned about sun, because there's a lot of sun around here. The rows run parallel to soil types, because we don't want irrigation lines crossing soil lines."

"As we replant, we use a backhoe and make a dozen soil tests," Kesner explains. "We make adjustments to the irrigation system and maybe even row orientation, depending on soil profile."

### Custom farming

Another reason wines made from Hudson Vineyards' grapes are so highly-regarded is what Hudson calls "custom farming."

"We do what our clients want us to do," Hudson explains. "We do it the way they want it. Jason e-mails everybody several times each year to get them to come out to the vineyard to see what the crop looks like and what it needs, and we work with them to do what they want."

For example, he notes a client who is concerned about a second crop: "We go through and remove it from both sides of the canopy," Kesner notes.

On the other hand, one client doesn't even come out to the vineyard at all, "because we're meeting or exceeding their expectations," Hudson adds.

Leaf removal is a critical element of custom farming, and Kesner's crew spends a considerable amount of time on it. "Leaf removal varies by vineyard block and varies dramatically by client," Kesner reports. "No client wants both sides leafed. The low-sun side gets leafed. How much is leafed varies from five leaves per vine total to all leaves on one side in the fruit zone.

"All leafing is done from the same side — that way we can see if there are any problems. The first leafing is right after bloom. But sometimes a client does not want leafing, and sometimes they want more. It is a joint decision. We also do leafing the day before harvest that allows us to pick faster — by 15 to 20% — and cleaner because it

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increases our ability to keep grapes from going to the sorting table.

Vertical Shoot-Positioned trellising is used for almost all vines. A little more foliage and relaxed canopies are left to reduce potential sunburn in varieties such as Grenache.

Cane pruning is used on 40 acres (about 32% of the total production acreage), because "we find it more conducive to the production levels we desire in our heritage-selection Chardonnays," Kesner says. He adds that Chardonnay is susceptible to Eutypa, and cane pruning makes fewer wounds. The remaining 105 acres is spur-pruned.

### Cropping levels

Average yield overall is three tons per acre. Pinot Noir ranges between two and three tons; Chardonnay between three and six tons; Syrah between three and 4.5 tons; Pinot Gris four to five tons; and Merlot anywhere from two to five tons.

"We won't let the vines produce more than that," Hudson says. "We operate most of the vineyards within that target. Most yields are reduced at the client's request, and our own viticultural practices also lower yields. We remove clusters that are sunburned, and on the other side of the canopy, we remove weak clusters."

### Vineyard staffing

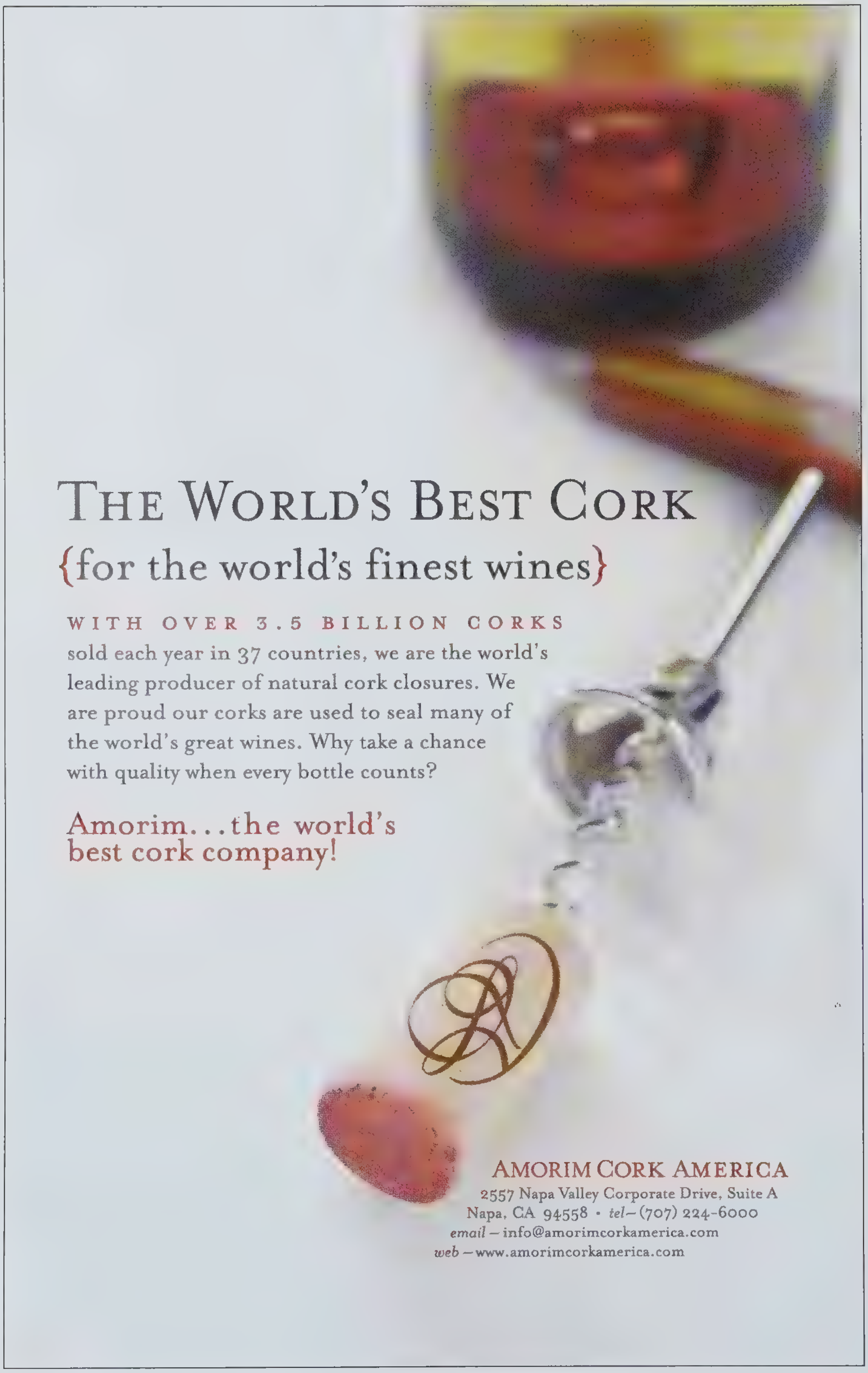
Hudson Vineyards uses about 24 employees during harvest and maintains a full-time crew of 12 to 14 employees. "We have reduced the number of work hours in a day (anywhere from 8 to 9.5 hours, season-dependent) to allow us to provide work over a longer period of time," Kesner says. Employees are provided with health care and housing. "All the foremen have housing on the ranch," he adds. "And we subsidize the rents at an apartment building in town for the workers."

Two work crews of eight people each handle harvest, and each crew includes a leafer to remove MOG, a tractor driver, and a light-boom operator.

"We do night harvesting of Chardonnay and finish before the sun comes up. Everyone loves it. We can go faster, and the crew is fresher," Kesner says. "We're increasingly harvesting reds at night and we don't like to pick after 11 AM. The heat is tough on the crew and the fruit heats up. We start with the reds at 4 AM and get a couple of hours in under the lights before daylight."

### Summary

Growing grapes for award-winning wines and using sustainable farming practices require a lot of labor. "We spend 250 hours per acre prior to harvest," Hudson notes. How does that compare to labor used elsewhere? In Australia, the average is 25 hours per acre. Hudson, Kesner, and the wineries they work with believe these efforts are worth the expense. ■



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# What the LABEL says about your wine

**BY Skye Hallberg & Ron Woloshun**
**Cogito Creative Works**

Designing a new label for Fred Scherrer is no easy task. He is a very particular man. At Scherrer Winery (Sebastopol, CA), he fine tunes the bottling machines himself; has four people on the sorting table at harvest when two would probably do perfectly; he conducts multiple blending trials on press fractions during day-long pressing; and he produces some of the best wines in California using his "I pay attention to every detail" style.

Early in 2006, I was at Scherrer Winery picking up a case of wine that a mutual friend had left for me when I pulled Scherrer aside. "Fred," I began, breathing in a big gulp of air, "your wines are sumptuous, but they don't taste quite as good as they could." He paused and looked down at me (it's a long way down — Fred is 6'2"), waiting for my critique. "Your label makes your wine taste just a tad … uh … generic."

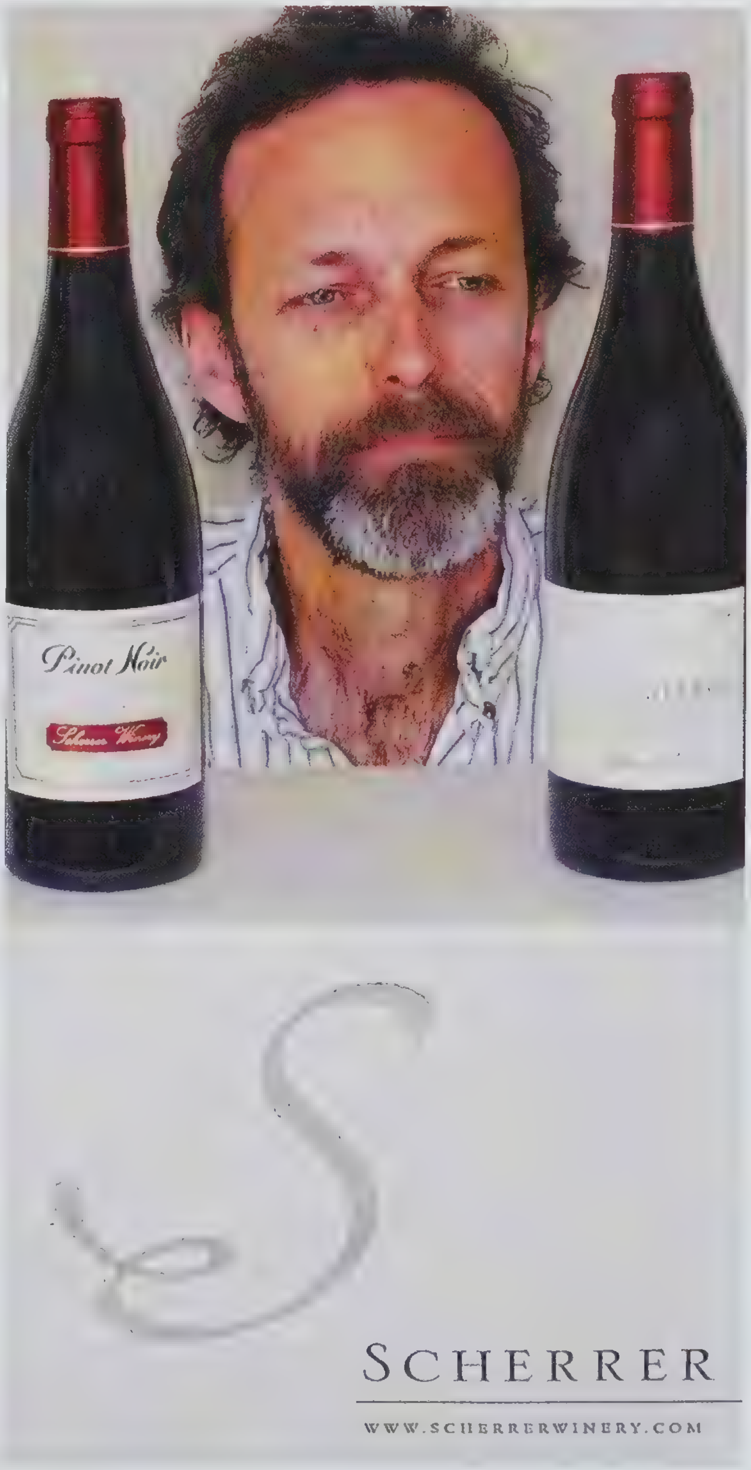
"Hmm, people like this label," replied Scherrer. "Besides, what does my label have to do with how the wine actually tastes?"

This is the story about why and how we changed the Scherrer wine label. It's also a story about how to create or change your label, so your wine tastes better to people. Yes, you read that right: You can make your wine taste better without touching what's inside at all.

Here's the process:

1. Find out what your current label *really* says to your customers.
2. Decide what you *want* your label to say about your wine.
3. Hire professional designers and give them direction.
4. Pick the label design that best delivers against the direction you set.
5. Print your new label.

In a nutshell, it's quite simple. Think of your label as an advertisement for what is inside the bottle. After all, people can only judge a wine by its cover … no quick sampling of its contents is allowed before purchase.



**Fred Scherrer with old label (left), new label (right) and new shipper.**

### *Before you design anything …*

1. UNDERSTAND THE PROBLEM: **Know what your current label is saying about your wine.** Few people understand exactly what their label communicates to consumers — the good, the bad, and the — oops — unintended.

Wine packaging gives cues to buyers about what to expect inside; signals that come from the bottle shape and color, capsule or closure, and perhaps most important, from the label. You'd like to think that you are in control of these "cues," but the reality is people infer messages from your packaging that you never expected.

What does your label say? Does it say: this is a homemade wine? That it's made by a corporation? An amateur? Will people think it's for boomers or millennials? Does the label suggest "heavy and peppery" when the wine is refreshing and fruity? Does it say the wine is sweet? Dry? A special occasion wine? Or something you'd take to a barbecue?

In a category where the packaging forms are pretty standard (three primary bottle shapes, mostly 750 ml sizes) and have been in use for the past 200+ years, things that seem like small variables (typeface, paper stock, kerning, shadowing, icons, spacing, alignment) can have a big impact.

Here's a test you can try yourself: Put your labeled bottle on a shelf among some dozen or so other comparable wines. Gather a handful of people typical of those who buy your wine (you're looking for first impressions — no use stacking the deck with loyal customers and in-laws).

Instead of asking them to pick out the best *label*, ask them to pick out the best *wine*. The most expensive one. The picnic wine. The wine they'd bring to their boss's house. The wine they think wine critics like best. The wine their beer-drinking cousin would buy.

Consumers may not be able to recognize exactly why they're getting these impressions, but a good designer can — and can explain it to you in simple, jargon-free English.

We put the Scherrer label through this test, and results confirmed our suspicions. While beautifully printed with gold foil and great attention to detail, people interpreted the message as, "This is a generic wine … most like a private label wine from CostPlus or Safeway."

We quickly sensed a problem in the label's hierarchy of information — a big red flag. The grape variety had more graphic emphasis than the winery name, which among American wines and food products, places it closer to a store brand than a fine upscale brand. This message mix-up lowered not only the perceived value of the wine, but also its perceived quality.

Consumer logic goes something like this: If it looks like a private label, it must be a little cheaper, and if it's cheaper, it can't be as good as a more expensive wine.

2. STRATEGY: **Know what you want to say about the wine inside the bottle.** Ask yourself, "What does someone need to know about my wine to make the decision to buy it?" Is it meant for a wine connoisseur? The collector? The adventurous wine lover who's always in search of a great find? Or for the "I'm just looking for a host-gift that won't embarrass me in front of my wine-snob friends" buyer? In what context will people see your wine or select it?

a. **Main Message:** When you think you've selected the main message you want your label to convey, ask: "Is this really what people want to know when they're choosing a wine?"

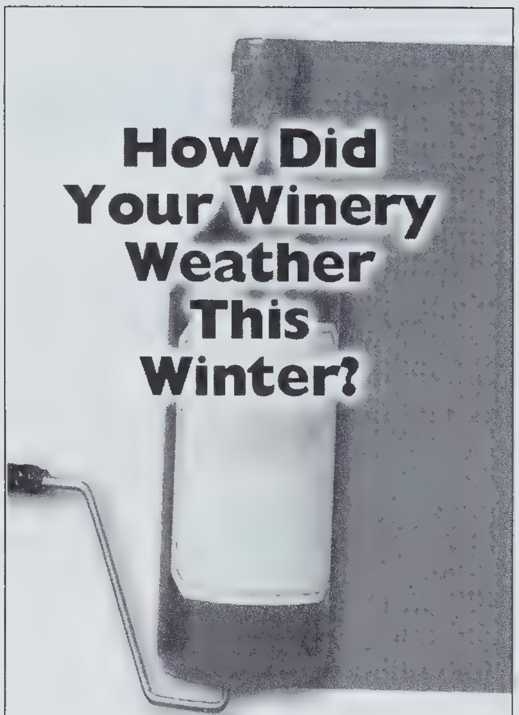
All too often winemakers begin a label design project by uttering that age-old, painfully obvious direction to their design team: "I want a wine label that I'll really like." What *you* like and what consumers will respond to is rarely the same.

**Wine as hero, not label as hero.** Scherrer wanted the label to support the wine quality, not to star in the show. That was music to our ears — because, all too often, wine labels are driven by design for its own sake, and not by the wine. When that happens, what you end up with is a fashion accessory. It's the difference between selling your wine and selling a four-inch square piece of artwork that happens to come attached to a free bottle of wine.

People are buying a bottle of wine, so it's the job of the label to enhance the sale of the wine itself. Before taking another step, we prepared package design objectives that read: "The label should increase the perceived value of Scherrer wines by reflecting the character and quality of the wine inside the bottle." This served as a guidepost for the entire redesign.

b. **Tone: Pick your wine's personality before the design starts.** This is often the hard part for most wine professionals. Do you want your wines to be seen as proud, loud, and glitzy? Soft, sensuous, and sexy? How do you know? There *are* ways of deciding on the "right" tone, and different designers use different techniques. Here's one that works for us.

We set a pile of 80+ cards in front of Scherrer, each one printed with a dif-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ferent product attribute, brand character, or value term. Then we asked him to help pick the tone and character he wanted to convey.

He finished this exercise with three piles in front of him: a stack of cards containing words that he felt were true of his wines, a stack that he felt did not match up with his wines at all, and a whole bunch that made didn't make it into either pile. We took the "yes" pile and asked "Cut it down to three words, please." We took the "no" pile and asked the same thing.

c. **Brand Equity and Technical Requirements: Know what equities are worth keeping.** Don't throw the baby out with the bathwater. Just about the biggest mistake you can make is to start from scratch when you should not.

If people really know you as "the wine with the armadillo on it," keep the icon. If you know they're looking for your purple label, don't change it to green. Do not listen to designers who can't work within those constraints.

Modify it, evolve it, renew it. But do not kid yourself. In a category with thousands of competitors, be realistic about whether or not buyers really use it to '"recognize" your label, be it at a store or across a restaurant aisle.

There are ways to deconstruct a current label to identify what's really valuable equity and what's just taking up label space, all of which your design team should know.

In the case of the Scherrer label, there were many discussions regarding the name badge. No doubt some loyal Scherrer customers had grown used to looking for the burgundy or black box, so it was arguably an equity; but its strongly bounded, heavy presence was tonally dissonant with Scherrer's (decidedly not boxed-in) winemaking style. It presented tactical problems also. In the end, we all agreed that the name badge's value was not as great as the value of accurately expressing the character of the wines.

d. **Write down your evaluation criteria.** There is no substitute for writing these down. After your first draft, take out the red pen and cross out all unnecessary words. You'll know which ones to cross out by how familiar they are. A design criterion of "traditional" will be much more useful to you than the vague "quality."

If your design objectives sound like "the purpose of the label is to convey that the wine inside is delicious, wonderful, high quality, warm, passionate, approachable, flavorful, pleasant, a good value, and an award winner," please start over. That's not design criteria … it's a laundry list.

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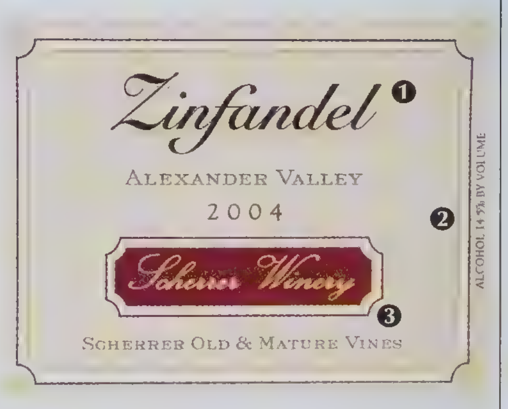
3. **Hire a professional design person/group/firm — and brief them well.** Your son-in-law may have the latest Photoshop software, and your niece may be quite the artist, but take our advice and don't do it. It's bad for family dynamics, and it's even worse for the label.

There are many trained graphic designers out there who want your business. There are lots of art directors and graphic designers who have experience designing wine labels. Some of them are even affordable. Choose someone you respect, who will listen, listen, and listen to you. Ask them to discuss a competitor's wine label or two.

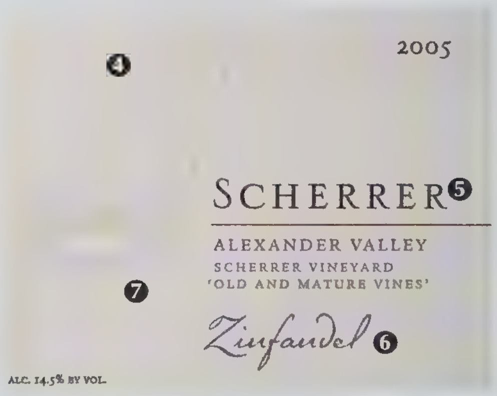
Ask them to discuss your label in detail. Make sure they can tell you not just whether a design works or not, but *why* — and in a way you can understand. Then, after you hire them, pay their bills on time — this keeps them happy, healthy, and working hard for your success.

If things cost a nickel or two more than you expected, go for it. As your biggest piece of advertising and the

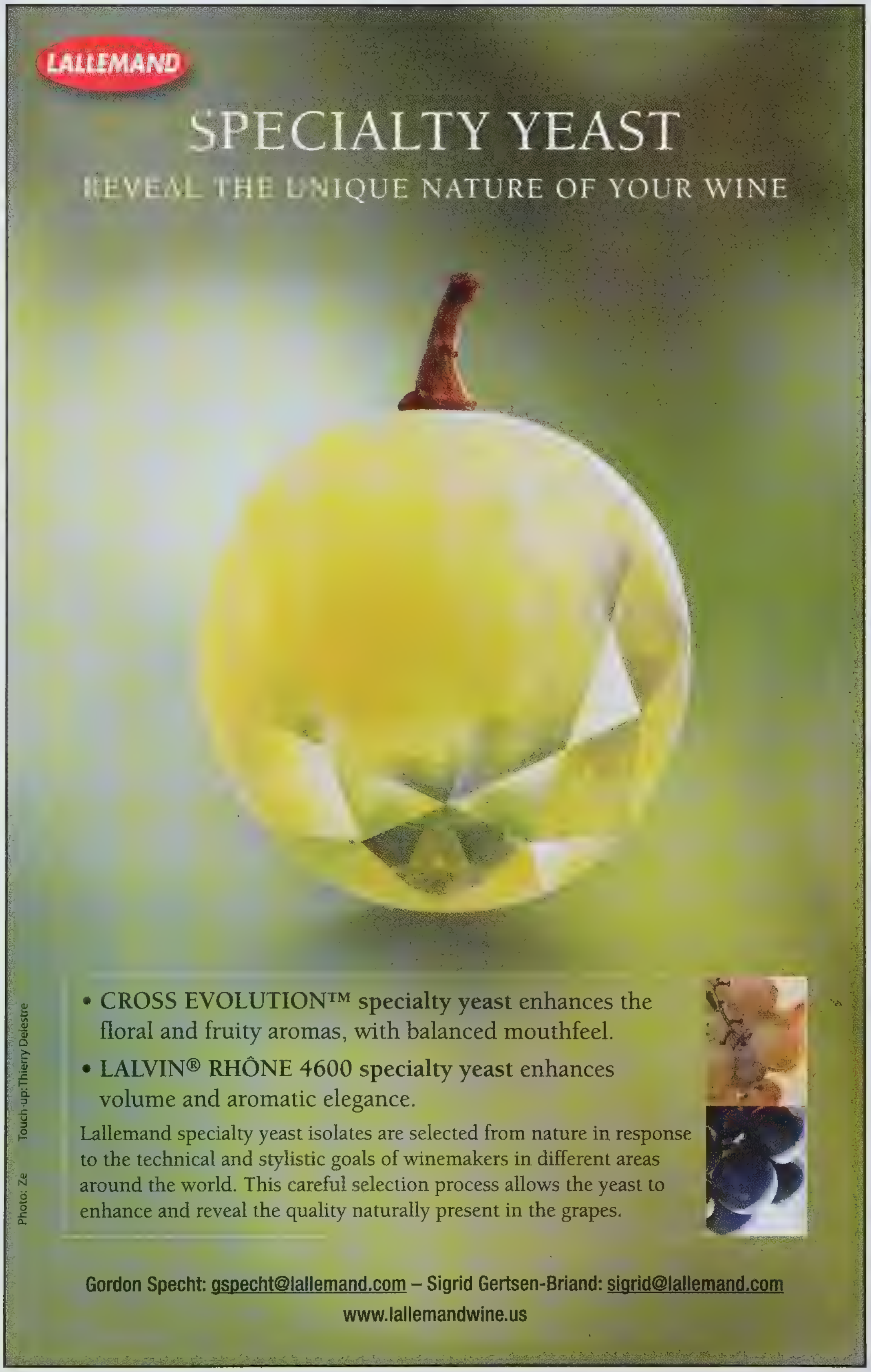
## Anatomy of a Label Redesign



1. **Varietal,** not brand, dominates the label; script typeface is fussy and mannered
2. **Decorative border** reduces valuable messaging area without adding significant graphic interest or personality
3. **Nameplate** is heavy and blocky; gold foil text on burgundy background is hard to read



4. **Embossed S** adds texture and graphic interest, balances the composition
5. **Letterspaced capitals** are stately and subtly imposing, improving legibility
6. **Wine variety** is subordinate to the brand; new script typeface feels more artisanal and handmade
7. **Asymmetrical composition** is striking and innovative; classic typography and careful placement of elements keep it from becoming cold or austere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first contact point most people will have with your wine, your label is far more important than your tasting room furniture.

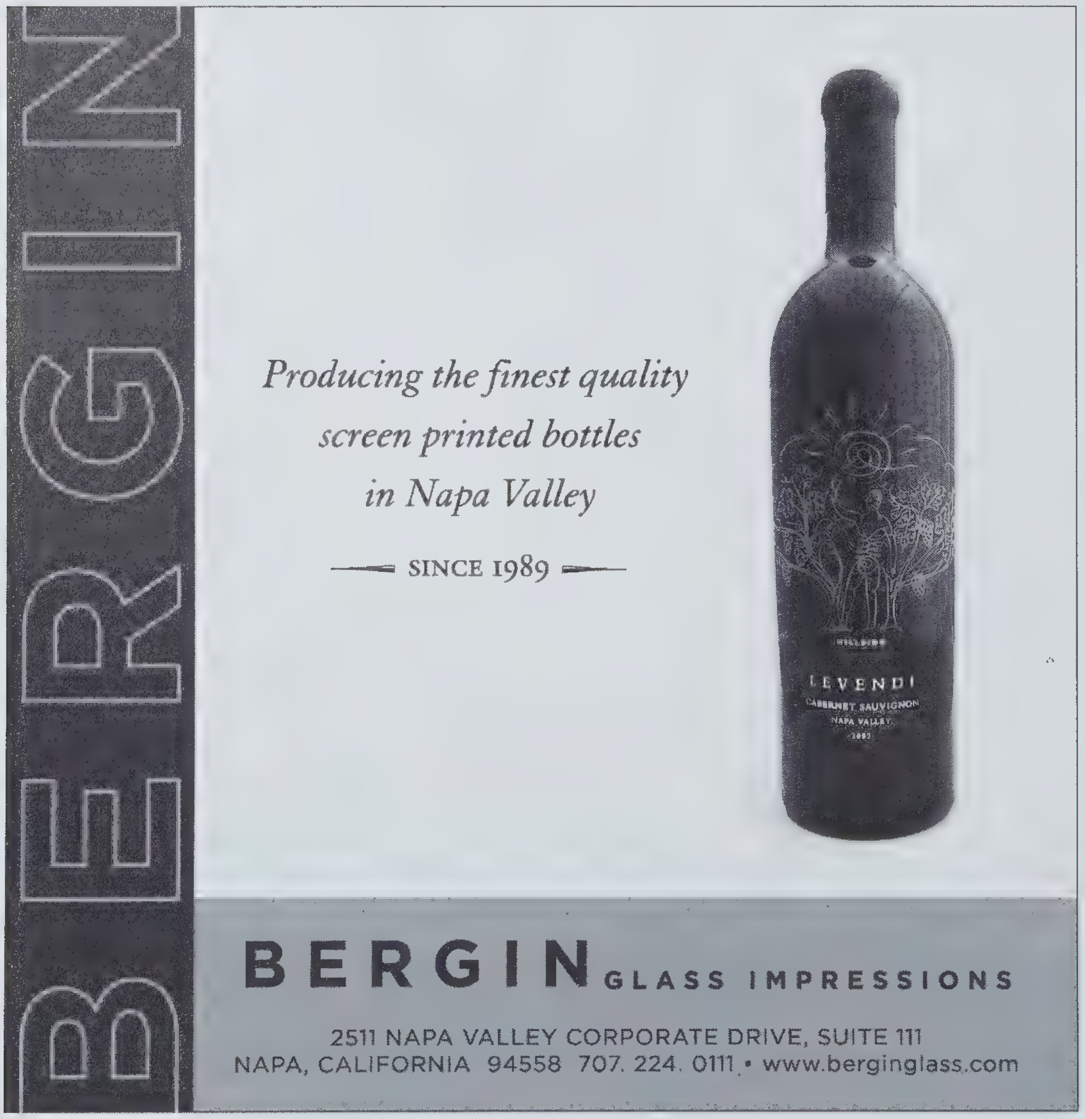
Our creative director, who designed the new Scherrer label, alerted Fred to one of the biggest visual problems with the existing label: the script typeface used for the words "Scherrer Winery." Scripts have a long and august history, but knowing how and when (not) to use them is something even many designers have trouble with.

A script face is almost always a terrible choice for a logotype. Besides being harder to read than Roman type, most simply don't have enough visual personality to make a strong, interesting logo, especially for words with a highly repetitive character count like "Scherrer." And those that do have a strong personality are too *something* — ornate, casual, cutesy, formal, or else unambiguously tied to a specific historical period, geographic area, or aesthetic movement.

In other words, they're perfect for evoking an extremely narrow, specific response. But even if that's the goal, choose carefully, because most of the time you'll end up with "fancy" — when what you probably wanted was "elegant." In this case, the script was a major tonal misstep, interfering with brand recognition and diminishing the perceived wine quality.

The solution was to "demote" the script typeface and use it only for the varietal (we chose an organic, hand-drawn face to communicate Scherrer's artisanal wine quality), while rendering the Scherrer name in carefully selected, painstakingly spaced capitals.

Because the human eye recognizes words by their shapes, and not by the individual letters within them, capitals slow the eye down, creating both emphasis and a sense of calm. The use of plainer "small caps" for the appellation, sub-appellation, and vineyard text extends the effect, resulting in a design that is dignified without being stiff or pompous,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Another issue was what's known as "borrowed interest" — using an irrelevant image or visual theme because it's aesthetically pleasing or "cool." (Even if you've never heard of it, you've seen it: think any "critter" or "car" wine, for a start.) Fred's borrowed interest was much less acute than most. A common fleur-de-lys typographic ornament appearing on the label and capsule took up space and was removed.

After exploring dozens of alternate ornaments and icons, one solution rose to the top — a custom-calligraphed cursive S that is unique and idiosyncratic, but also steeped in tradition, much like Scherrer's winemaking.

4. Judging designs: **Pick the design that best addresses the design objectives, not the one you believe is prettiest.** The design you like best, or the most unusual design, or even the design that wins an award is not necessarily the best design for your label.

Design is very different from art — it's a mode of communication and, as such, should serve the product first and foremost. Therefore, keep your design objectives and evaluation criteria at hand when you review label designs. Ask your designer to read them aloud before every presentation. Evaluate every detail through the lens of how well it meets these criteria.

Then, ask yourself a few more questions: Does it look original? Or would the label be equally legitimate if you just swapped in another winery name?

5. Print your new label well. You wouldn't use low-quality grapes for your wine, so do not use a low-quality printer to print your labels. When choosing a printer, send a rough draft of the label artwork and ask them to point out anything that might be an issue on press.

Ask for samples of similar projects the printer has produced and a range of their other work. Never forget that the paper stock makes a difference. True, you can print anything on white, coated stock, including that ancient parchment texture you've fallen in love with; but the right paper choice can completely transform a design.

For the Scherrer label, our creative director worked with Spectrum Label Corp. (Hayward, CA), to find an uncoated, textured stock — a much better solution than hammering plain old white, coated paper into a simulacrum of what we wanted to communicate.

Another rule of thumb: in wine labels, less actually *is* more. Years ago, metallic inks and foil hot-stamping were much more expensive than they are today, with the result that they served as an easy shorthand to add depth to a design and denote high quality. But now, they're so commonplace that it is sometimes hard to tell the difference between a wine bottle and a container for a mass-produced packaged food.

Foil stamping and metallic inks have become ubiquitous on corporate brands of wine, the $8 fighting varietals in the chain store shelf-space wars. Just as four-color printing on white, coated paper often says "slick, corporate, mass-produced wine," metallics or foils risk coming across as frippery — again, fancy rather than elegant.

But, setting this process aside, changing the label doesn't *actually* change the way the wine tastes … does it?

We asked 200 people in three cities to taste the same (unlabeled) white wine, poured from two different colored glass bottles — one a grassy green, the other a smoky gray. We never mentioned the bottles, asking people instead to describe the *wine* they were tasting (remember, it was the same wine in both bottles).

Two hundred comments later, one wine was overwhelmingly described as "grassy, fruity, bright, fresh" and the other as "complex, smoky, sophisticated, and mature." It hardly matters that one was overwhelmingly judged superior to the other; the real lesson is just how much packaging can and does alter our experience of a wine.

When a label sends the wrong messages, consumers are predisposed to notice "flaws" in the wine they don't even know they're looking for — no matter how enthusiastically the sommelier or wine seller might recommend a wine.

The new Scherrer label doesn't just look better, it sets higher expec-

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tations and prepares the taster for Fred Scherrer's complex, understated vintages. It allows sommeliers to recommend the wines, and wine merchants to stock them, more confidently — without having to reassure their patrons that despite appearances, the wine really is as good as they say.

Most important perhaps, the new label strengthens Scherrer Winery's position in an industry that becomes more challenging for small wineries every year. It commands a higher price-point by reflecting the exacting standards and tireless attention to detail that go into every bottle of Scherrer wine.

## Conclusion

This kind of label design is not easy; it takes time, a lot of analysis, and thought. But by focusing on a consistent and deliberate visual message based on a carefully developed communication strategy, and by working with a designer or agency that knows how to translate that strategy into an original and meaningful design, you'll be amazed at what the right label can do for your wine.

In Fred Scherrer's words, "These guys were amazing. At every step, they made it clear that this project was not about design for its own sake — it was about the wines. Even my wife thinks our wines taste better now!" ■

### About the Authors

*Skye Hallberg has an extensive background in brand management (Proctor & Gamble), advertising (Young & Rubicam, BBDO), design and marketing consulting. She heads up Cogito's marketing department and grows old-vine Pinot Noir.*

*Cogito's Creative Director, Ron Woloshun, is an unreconstructed lover of typography, wine, and electronic gadgets. His deft touch with design, advertising, packaging, and identity development is widely recognized.*

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## BENEFITS OF SUBSCRIPTION MODEL

# Hosted services model for winery websites

**BY** **Ron Kreutzer, President, WineWeb Enterprises, Inc.**

When any small to medium-size business wants to create their first website, or revise their existing website to provide additional functionality, there have, until now, been two choices: buy a ready-made website or build your own website from scratch. In the wine industry, there exists a third choice: the "subscribe" model. Let's examine website models available and identify when the subscribe model can make business sense.

### *The Models: Buy, Build, or Subscribe*

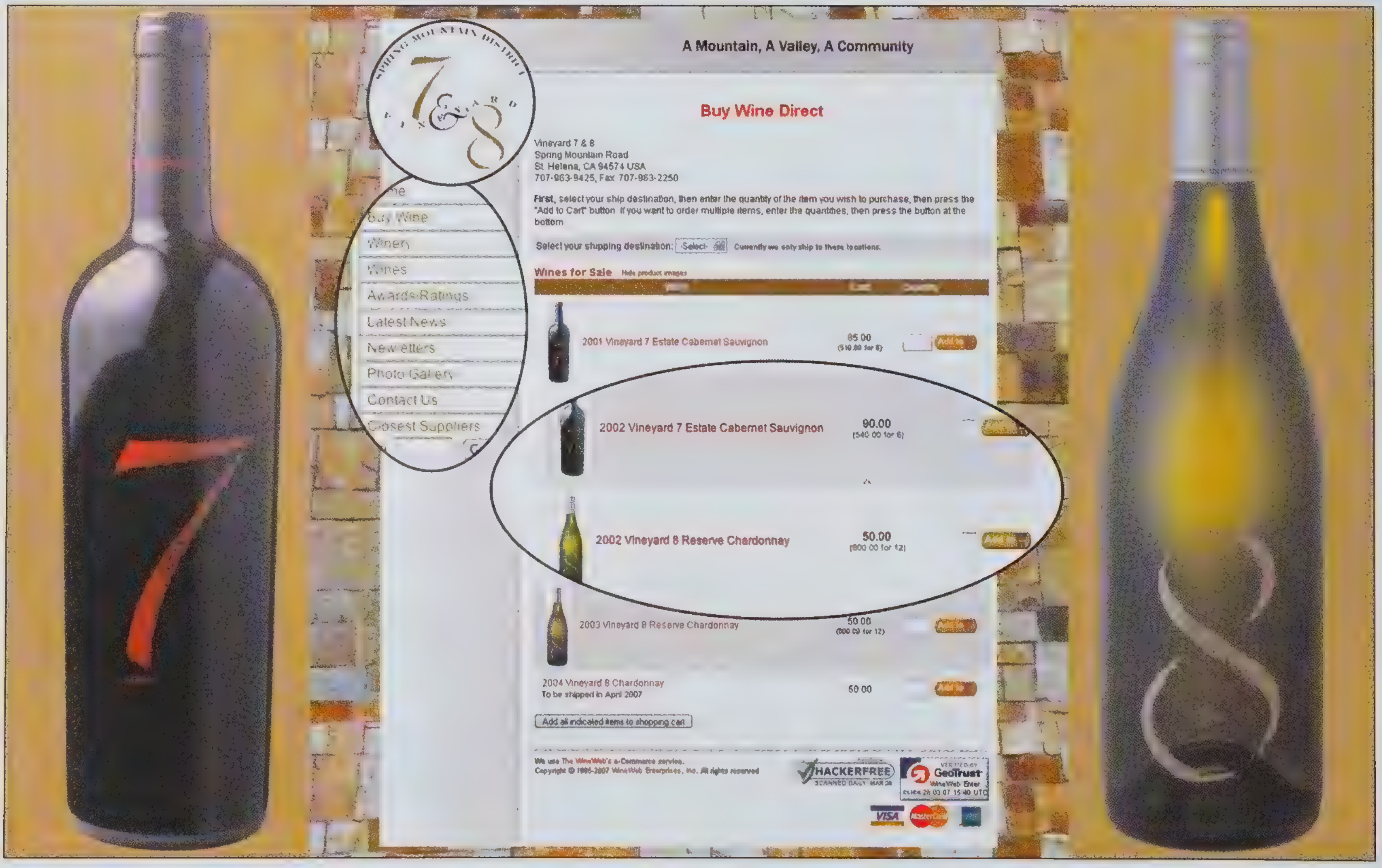
When considering website software for your winery, the common practice is to research software packages in the market and decide if your requirements can be satisfied by an existing package (buy) or if your requirements are unique enough that you must create your own technology solution (build), either by hiring a professional website developer or by using in-house staff.

There is a third option for wineries considering an initial website or a more robust website. Several service providers offer website solutions on a subscription model, specific to the wine industry.

This "rent" or "subscribe" model may also be called a "hosted solution" or an "application service provider" model, but the concept is the same, and it can provide advantages over the buy or build models. Typically, there is nothing to install on your computer, ongoing enhancements are included in the subscription, and someone else ensures that the application is running and maintained. A major disadvantage to this model is that there are recurring fees, although a cost-benefit analysis may show that adding the extra costs of the buy or build model tilts the advantage to the subscribe model.

### *Subscription Model*

In evaluating the options for your winery's website, and for your winery's entire online presence, consideration should be given to both costs and features. In addition, a winery should consider factors such as the dynamics of the wine industry and extra value that can be provided by subscribing to a service. The following sections out-



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line the major factors that should be considered in your decision process.

***Robustness***

"Robustness" refers to more than just the feature set provided by a website package or service. Sure, the service must allow you to create content so online visitors can understand your winery and its products. This content, at a minimum, should include information on your winery, vineyards, winemaking, wines, vintages, accolades (awards and ratings), wine clubs, news and events, contacts, and directions to visit the winery.

The robustness of a website also refers to ease of navigation, user-friendliness, page load speed, useful traffic statistics, e-commerce options, and communication options (both to and from your website visitors).

Service providers who offer a website subscription model typically have spent much time and effort in creating a robust offering, specific to the industry. Their ability to leverage this investment across many winery subscribers results in economies of scale compared to a custom-built website.

In addition, a developer hired to create a custom website for your winery may not have the requisite experience in all elements needed, including graphic design, website design, information technology best practices, data modeling, web development, and wine industry expertise.

***Ability to customize***

A successful website not only needs to be robust, but should also reflect the winery's style and philosophy. This includes using your winery's graphic elements and color themes. Be sure to review the level of customization allowed in a hosted solution.

You don't want a website that looks identical to your neighbor's website. A well-designed hosted website can provide a custom look and feel for your winery, by separating the presentation layer (fonts, colors, graphics) from the content.

While a custom-built website can be created to precisely match the design elements set by you or your staff, you must remember the business goals of your online presence. Typically, those business goals are focused on marketing and selling wine.

While an initial two-minute movie on the history of the winery may have a "wow" factor from a technology and entertainment perspective, many potential customers may abandon your website before reaching the order form. The hosted website will make sure you don't forget any essential element.

***Ongoing maintenance***

As soon as your website is installed for all to see, it immediately becomes dated. Fresh content is key to the return of poten-

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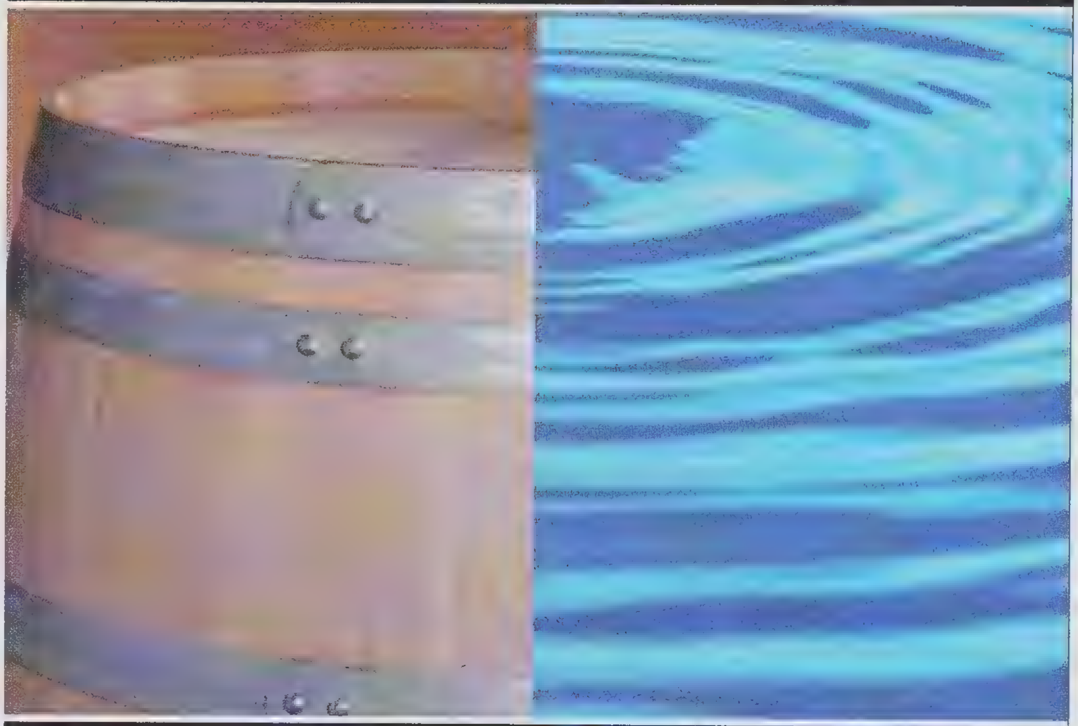

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tial customers. Your staff must be able to easily change content on your website.

You should not need to call a website developer every time you add a new vintage or add a new state to which you can ship. Most service-providers offer a "content management system" that allows a non-technical person to make changes to the website.

In addition, some service providers allow your staff to modify parameters that control processing, such as changing the mixed-case discount percentage, or the credit cards that you accept. A good content management system will be industry-specific and will automate most, if not all, of the web page creation and linking tasks.

Another factor to consider is the physical and technical maintenance of the website. Items such as interface changes to credit card processing or shipping carrier systems, and shopping cart changes to support new state regulations can be expensive, and are frequently overlooked. Forgetting about items such as data backups, web server software upgrades, and web server monitoring can be costly to your business, also.

### *Industry dynamics*

A major factor to consider in looking at the subscription model is the stability of your winery and the overall stability of the industry. In the wine industry, we live in challenging and rapidly changing times. More direct shipping states are opening to your wines, each with its own regulations. Not only are states looking at direct-to-consumer sales, but some states are now revisiting their direct-to-trade sales laws.

Not since Prohibition have the wine laws been in such flux. Likely your winery wants to participate in selling wine to an expanding online population.

This factor is huge in considering a subscription-based model. Service providers revise and enhance their product for industry changes, and many of these revisions are included in their service at no additional cost. As you evaluate service providers, be sure to understand the enhancements that are included in the subscription price.

You should review the service provider's enhancement history by looking at their recent press releases, blog entries and "what's new" web pages. Be sure to review the service agreement to uncover any hidden costs for enhancements.

### *Cost*

The recurring cost of a subscription model is usually cited as a disadvantage, especially by professional website developers, whose livelihood depends on creating custom websites. A closer look, however, can negate any disadvantage, and in many instances can prove that the subscription model actually has a lower total cost of ownership (TCO).

To start a cost analysis, the initial cost of a custom-built or purchased solution should be amortized over no more than three years, given the dynamics of the technology and the industry. Then look at the additional costs involved in maintaining the website, including:

1. Website hosting;
2. Software maintenance fees;
3. E-mail communication fees;
4. Technical services required to revise your content and operating parameters;
5. Technical services required to maintain the physical web server and the software applications;
6. Your staff's time in keeping current on the regulatory changes so as to advise the service provider of required changes to the website;
7. Your staff's time in dealing with the service provider to report problems, request enhancements, and negotiate services and pricing;
8. Maintaining backups of your data;
9. Your staff's time in processing online orders, extracting transaction data for compliance reporting, and back-office processes.

Not only could the costs be less expensive with a subscription model, but due to the proactive nature of the service provider, your staff is likely to spend less time with website issues and enhancements.

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### Extras

Some service providers offer additional services as part of the subscription package. These could include marketing services, design services, and services aimed at driving more online traffic, and potential customers, to your website. A service provider may also offer a "portal website" for its customers.

Combining many winery websites into such a common service allows visitors to "discover" your wines by using general search terms, instead of relying on them to know of your winery and search for it directly. These extra services provide added business benefit and lead to more online sales.

### ROI factor

Your investment in an online presence should be treated similarly to any other business investment. As part of your cost-benefit analysis, there should be a way to calculate a return on investment (ROI). The buy and build models have a large initial cost and variable ongoing costs, making an ROI calculation difficult. The subscription model can make the ROI calculation easier. A service provider's pricing structure can further ease the matching of costs to benefits.

Some service providers have component-based pricing, which allows you to subscribe to only the components needed. In addition, some pricing may be based on a cost-per-transaction or a percentage-of-sales model, which can simplify calculating ROI.

### Winery case study

Vineyard 7&8 (St. Helena, CA) is an example of a winery that has adopted the hosted model for its website and e-commerce processes. Purchased in 1999 by John & Louise Steffens, Vineyard 7 & 8 produced its first commercial release in 2001. Located at the top of Spring Mountain in Napa Valley, the winery's goal is to make the best possible California Cabernet Sauvignon (called "Vineyard 7") from the Spring Mountain terroir, and it also produces a high-quality Chardonnay ("Vineyard 8").

After hiring consulting winemaker Christian LeSommer, formerly of Chateau Latour, the Vineyard 7 & 8 management team began focusing on the construction of their own winery facility, as well as building a market for their wines, with a component comprised of online sales. The winery produces 1,600 cases per year, with a capacity and permit to produce up to 8,000 cases annually.

"Starting a new winery with no legacy systems gave us the flexibility to choose a solution that could grow as our needs expanded," states Gary Cowan, winery consultant, who has represented the managing partners from the beginning of the project.

The winery needed an innovative and customizable technology to create an online venue that allows customers to order their wines.

"We saw the hosted model as a way to create a technology solution with minimal upfront cost and effort," adds Cowan. "We started small with the goal of providing information about our wines and allowing customers to acquire them."

The winery began by posting content about their winery, wines, and news items into the service provider's content management system. This allowed winery staff to become familiar with the content maintenance process. An online look and feel was created to match the winery's vision and theme.

Next came the setup of the ordering and shipping parameters that control the e-commerce service and allow online sales. Hosting the website under the winery's domain name (vineyard7and8.com) was a logical next step.

Over the past two years, online sales have been driven by word-of-mouth and referrals to the website from reviews and press coverage. In 2007, the winery will expand into direct-to-trade sales where there is limited distribution of the wines.

"As new needs arise for our online site, we don't need to spend time and effort in developing a solution and negotiating pricing — it's just another feature within the service," states Cowan.

Since adopting the hosted model for the website, the winery's online traffic has increased four-fold, now averaging 2,300 page views per month. While many factors can contribute to an increase in overall traffic, a three-fold increase in the average visit length to over 90 seconds can be attributed to the quality of information presented on the

Continued on page 94

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# Influence of available water and salinity on rootstock selection

**BY** Daniel Roberts and Alfred Cass

Choice of rootstock is a critical issue in successful vineyard development. Unless a grower plans to use own-rooted vines, many factors affect rootstock choice. The presence of certain nematodes (ring, root knot, and/or dagger) limits rootstock choice, for example, amongst other considerations such as soil moisture and soil chemistry.

Acidic soil pH is also important mostly, due to aluminum solubility issues below pH 4.8, which can be remediated through the application of lime and gypsum.

In soils where magnesium accounts for more than 40% of the Cation Exchange Capacity, it would be wise to choose a rootstock with the ability to acquire potassium, such as 101-14. Soils irrigated with water high in boron (1.2 mg/L in poorly-drained clay soils; in well-drained soils, boron can reach 2 mg/L) require such rootstocks as 1103P or 140R.

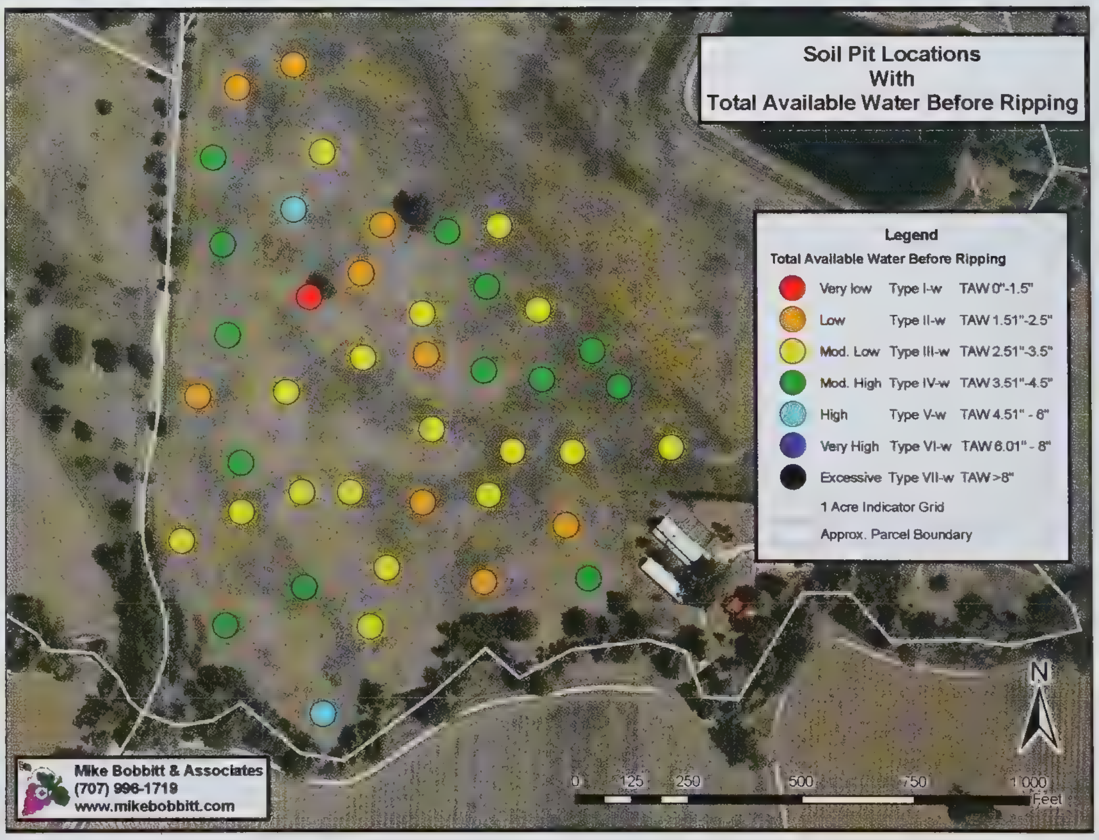
### *Available soil water*

More often than not, we have to use rootstocks for premium wine production. If your site has no nematode or soil magnesium or boron issues, what criteria do you use to select a rootstock? How should you divide the property into irrigation blocks that are not arbitrary?

The answer to both questions is to use the Total Available Water (TAW) capacity of the soil. The amount of water that will be available to the vines within the root volume after the site is prepared for planting, is the most fundamental issue determining rootstock choice.

TAW is defined as the difference between field capacity and permanent wilting point. Field capacity is the volumetric percentage of water remaining in the root zone after free drainage has ceased. Permanent wilting point is the soil moisture content at which plants wilt unrecoverably. TAW is usually expressed in inches of water depth and must be constrained to include only the Effective Root Depth (ERD) of vines. ERD is the depth containing the majority (85% or more) of fine roots (0.1 inches or larger in diameter).

The amount of available water in the root zone is the primary determinant of vine vigor. There are other factors affecting vigor, but control of available water, first by limiting ripping depth to limit root volume and then limit irrigation, are fundamental means to limit excess vigor.


Soil Pit Locations
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1 Acre Indicator Grid
Approx. Parcel Boundary
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**Figure I. Spatial distribution of Total Available Water of native soil before ripping.**

### *Matching rootstock to TAW*

Even though there is no direct relationship between rootstocks and vine growth rate, we know that Riparia Gloire is less vigorous than 1103P. Experience has shown that in the same soil under similar management, the order of non-vigorous to vigorous rootstocks is:

- Riparia Gloire
- 420A
- 101-14 or 3309C
- 110R
- 1103P
- 140R

Recent research has found that the differences in scion vigor of different rootstocks may be due to differences in the root architecture of the rootstock. In a review article on grapevine rooting patterns, D.R. Smart *et al* found that 60% of the roots of 5C, 420A, and 110R were in the top 24 inches of the soil profile.[10] The authors also noted that both 420A and 110R exhibit deep rooting patterns. They concluded that other factors besides rooting volume may be important in determining scion vigor characteristics (or potential).

J. Swanepoel and J.M. Southey found that the difference in rootstock performance has more to do with root density.[13] They found that 1103P, 101-14, and 110R had greater rooting densities (grams of biomass per square meter) to depth than other rootstocks examined.

D.R. Smart *et al* also suggested that root density, rather than root depth, may be the key difference between rootstock influences on scion growth.[10] Earlier research by L. Morano and M. Kliewer found that St. George had more roots per soil volume and was more deeply rooted than 110R or AXR-1.[8] St. George also produced the heaviest pruning weights.

Table I shows rootstock selection in relation to Total Available Water in the vine root volume. We developed Table I over a 10-year period, based on research and commercial experience in California and Australia. Paul Anamosa has recently assisted in some modifications to the table.

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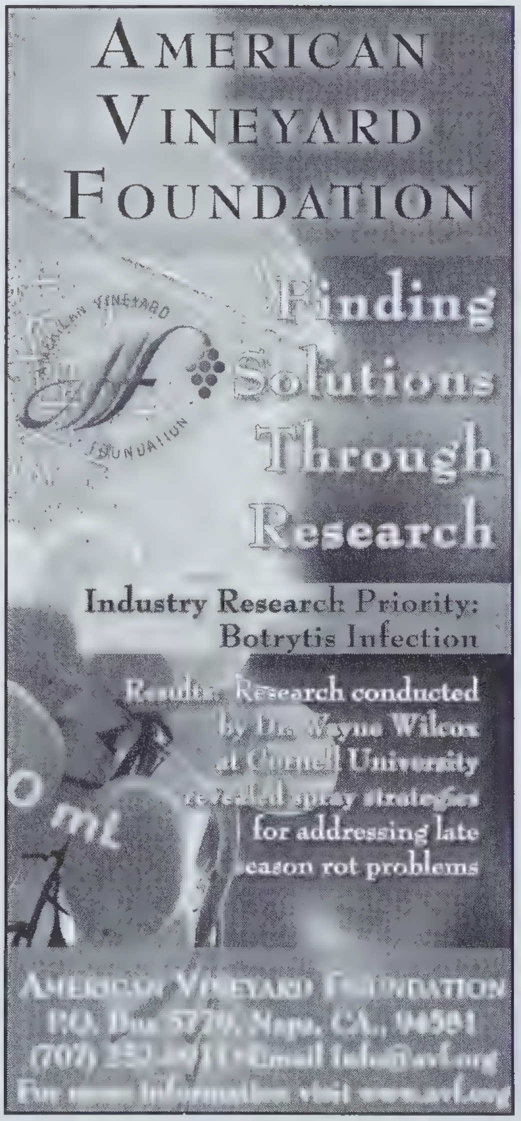
The relationship between TAW and rootstock selection in Table I is based on the intention of growing "small" vines. By definition, small vines are spaced three to four feet between vines, cane-pruned, and shoot-thinned to three shoots per foot. They have 36 to 48 inches of shoot growth by veraison and are cropped at 2.5 to 3.5 lbs of fruit per vine, depending on variety. The small vine concept is geared towards production of very high-end wines.

The choice of 110R versus 3309C with a TAW of less than 1.5 inches of water depends on irrigation water availability. If there is sufficient irrigation water, then 3309C is the rootstock of choice because it is much easier to maintain small internodes on 3309C than on 110R, especially if rain occurs in late spring.

At the high end of each TAW-class boundary, rootstock choice is somewhat arbitrary but can be related to rainfall. For example, the rootstock choice in the transition from soil type V to VI at a TAW of six inches of water should dictate Riparia Gloire in an area that is likely to receive spring rains, such as the Sonoma Coast of California. In the next column, we will discuss the influence of climate and rootstock selection in more detail.



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### Soil ripping to improve TAW

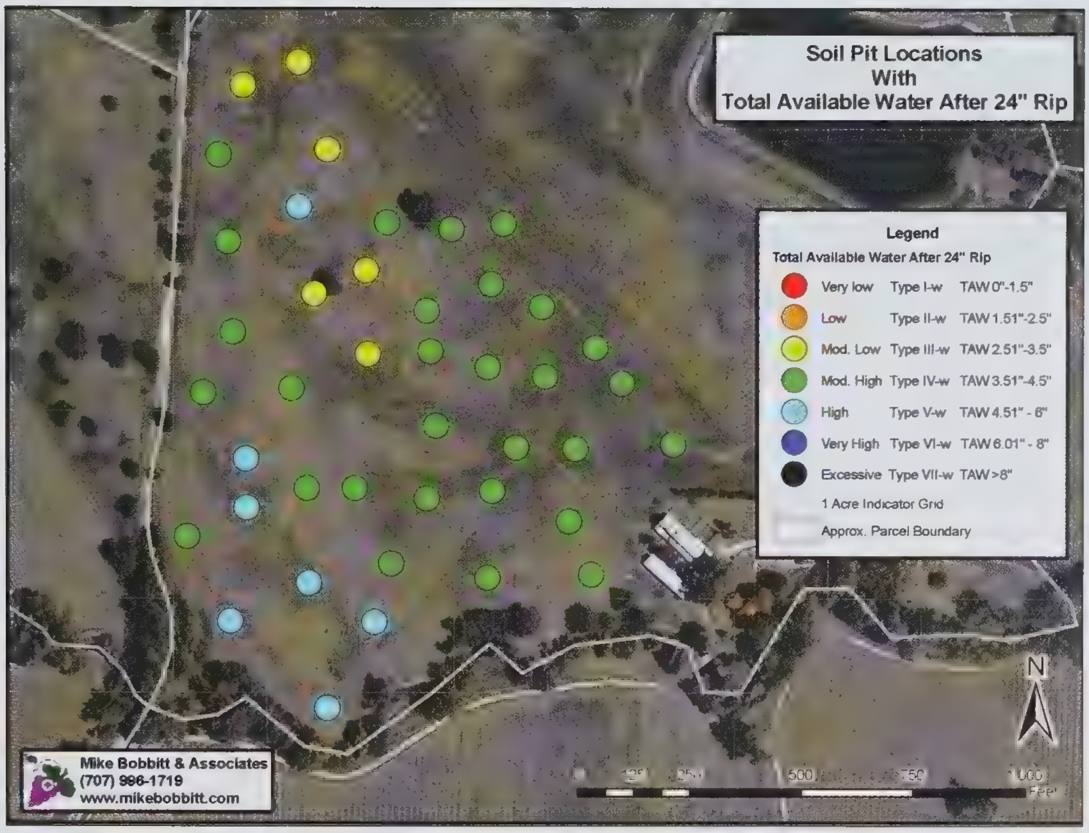
TAW is often estimated using only soil texture. However, this approach does not consider soil structure or stoniness and ignores soil structure and the positive benefits that come from ameliorating soil structure by ripping the soil prior to planting.

TAW should be calculated using all soil physical characteristics: texture, structure, rock content, clay plasticity, sand grade, and soil layer sequences. Simulation models are available in soil physics literature to calculate TAW and can also be used to simulate the effects of ripping on TAW, providing the opportunity to optimize ripping depth and match this with rootstock choice.

The deeper the soil is ripped, the greater the root volume available to vines and the more water the vine roots will be able to access for growth. Very deep ripping, as opposed to shallow ripping, can be used to manipulate vine vigor if used in conjunction with wise rootstock choice. However, this approach requires better ripping techniques than have traditionally been used in California.[2]

TAW values determined before ripping and simulated for various depths of ripping can be mapped using GPS (Figure I), giving an easily understood visual of the spatial distribution of TAW across a property. These maps can serve as a basis for optimizing ripping depth along with rootstock choices, for grouping soils with similar TAW regions into irrigation blocks, and for depicting the boundaries on maps.

Figure I illustrates how the TAW values prior to ripping indicate significant variability across the site. After a 24-inch ripping (Figure II), simulation data shows that the site will likely be


Soil Pit Locations
With
Total Available Water After 24" Rip
Legend
Total Available Water After 24" Rip
Very low Type I-w TAW 0"-1.5"
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Excessive Type VII-w TAW >8"
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**Figure II. Spatial distribution of Total Available Water of native soil after ripping.**

more uniform, producing mostly moderately high TAW values, indicating it should be planted to 420A (Table I). The remaining variation can be reduced by dividing the site into smaller irrigation blocks, as shown in Figure III.

In vineyard development, it is important to design blocks where fruit ripens uniformly. Regardless of how ripeness is defined, winemakers prefer fruit to be within a narrow maturity range as opposed to receiving fruit that ranges from 21° to 27° Brix. This can be facilitated by designing irrigation blocks that are as uniform as possible.

### *Salinity, sodicity, and calcareous soils*

Salinity is the summation of all soluble ions in the soil solution (mostly Ca, Mg, Na, Cl, $SO_4$, $HCO_3$). It is assessed indirectly by measuring the electrical conductivity of a saturation extract of the soil ($EC_{se}$, with units in decisiemens per meter [dS/m].

The main problem with high salinity is that it retards water uptake by

**Table I. Total Available water (TAW) in the Effective Root Depth (ERD) and the most appropriate rootstock choices for a moist climate (mean annual winter rainfall greater than 15 to 20 inches, minimal summer rainfall) and non-saline soils (electrical conductivity of a soil saturation extract less than 2 dS/m).**

| TAW in the ERD (in inches) | TAW Class Name | Rating | Rootstock Choices |
|---|---|---|---|
| Less than 1.5 | $\mathrm{I}_\mathrm{w}$ | Very Low | 110R, 3309C |
| 1.5–2.5 | $\mathrm{II}_\mathrm{w}$ | Low | 3309C, 1616C, 101-14 |
| 2.5–3.5 | $\mathrm{III}_\mathrm{w}$ | Moderately Low | 3309C,101-14, 420A |
| 3.5–4.5 | $\mathrm{IV}_\mathrm{w}$ | Moderately High | 420A |
| 4.5–6.0 | $\mathrm{V}_\mathrm{w}$ | High | 420A, Riparia Gloire |
| 6.0–8.0 | $\mathrm{VI}_\mathrm{w}$ | Very High | Riparia Gloire |
| Greater than 8.0 | $\mathrm{VII}_\mathrm{w}$ | Excessive | Not suitable for wine grapes |

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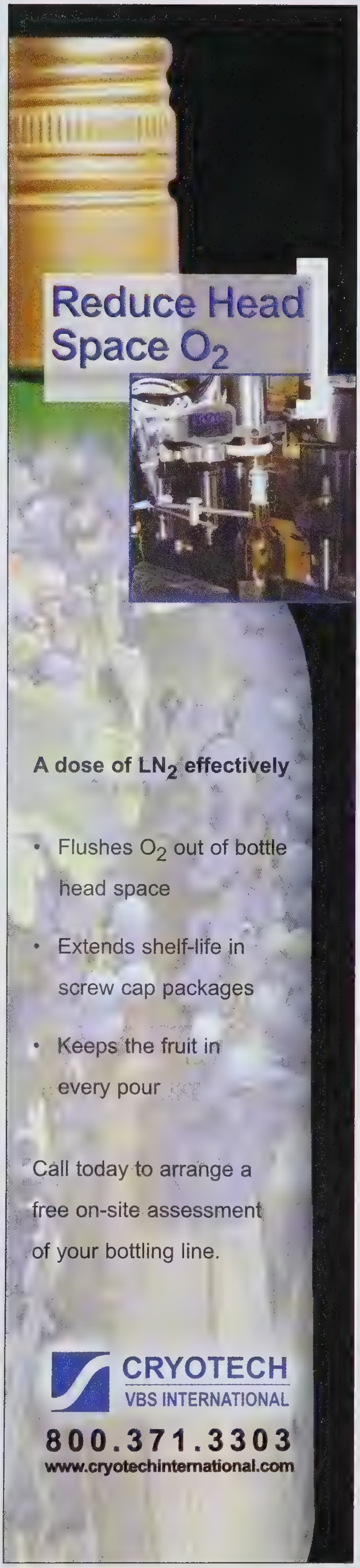
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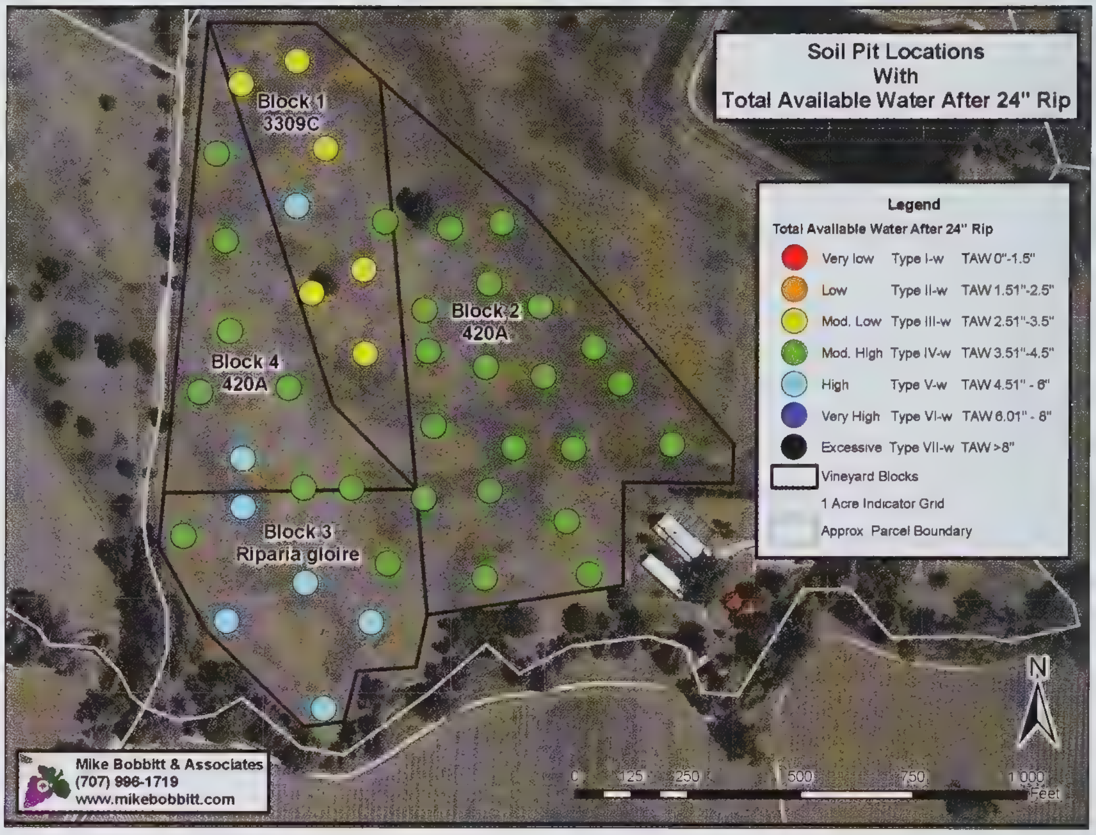
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3309C
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**Figure III. Subdivision of the property showing irrigation blocks and rootstock recommendations based on Total Available Water expected to be present in the ripping depth after ripping to 24 inches.**

vine roots and produces toxic effects due to the high concentrations of sodium, chloride, and other ions around the roots. Vines are sensitive to salinity.

Own-rooted vines and most rootstocks are adversely affected by salinity in excess of 2 to 4 dS/m, which is misleadingly described as "slightly saline." Beyond about 6 dS/m, own-rooted vines and most rootstocks may be killed by salinity, but this upper limit does vary with the kind of salinity and other environmental factors discussed below.

High concentrations of chloride (more than 10 meq/L or mmol/L) have adverse effects on vine growth. Chloride is closely associated with sodium and other ions in the soil solution, and it may be difficult to distinguish between the adverse effects of high salinity on water relations and the toxic effects of chloride.

In contrast to sodium, chloride is readily taken up by vines and transported to leaves where cell damage can occur. High levels of chloride can only be combated by leaching the ion out of the soil. This means that soil structure and internal soil drainage are important, and winter rain or a source of good quality irrigation water is necessary for leaching salt out of the vine root zone.

Sodicity is an excess of sodium ions compared to magnesium and particularly calcium. It does not have direct effects on vines unless the concentration is very high. Studies in Australia indicate that yield loss due to sodium occurred at 160 mmol/kg dry weight leaf tissue and at 0.5% in petioles.[3,12]

Most of the yield loss due to saline soils in California vineyards is from chloride toxicity and is seen when chloride exceeds 1.0% in petioles at veraison. The highest petiole sodium levels in the Cl toxicity-affected vineyards at veraison did not exceed 0.10%, indicating that sodium was not the problem. Potassium deficiency is a significant problem in such vineyards, possibly due to sodium interfering in potassium uptake.[6]

The main deleterious effect of excessive sodium is on soil structure.[1] Sodium destabilizes soil aggregates, which disintegrate when exposed to rain or irrigation water. The fragmented segments block soil pores, causing hard setting and poor internal drainage. Sodium is counteracted by applying gypsum to soil. The interaction releases calcium ions, displacing the sodium, which must leached out by rainfall or irrigation.

The response of rootstocks to salinity varies from place to place. The variables that appear to be responsible for differences in salt tolerance include:

- climate (hot/dry as opposed to cool/dry or cool/wet climates),
- soil types (sandy versus clayey texture, hard-setting versus friable soils, well-drained versus poor drainage),
- kind of salinity (chloride toxicity or just osmotic stress from calcium and magnesium sulfate).

Rootstock responses to these factors are not fully understood, so caution is necessary in selecting salt-tolerant rootstocks in any particular region. Local knowledge is particularly valuable in fine-tuning your selection.

In particular, less severe salinity effects are seen in vines where the irrigation water or soil salinity is due to calcium and magnesium sulfate rather than sodium chloride. The principle reason for this is that calcium and magnesium sulfate ions are not harmful to the vine physiology, other than by limiting available water because of the osmotic potential. However, no critical limits for vine performance arising from sulfate salts have been published to date.

The following remarks are applicable to areas where the predominant source of salinity is sodium chloride. If the soil saturation extract electrical conductivity (EC) is less than 2 dS/m and the soil chloride concentration is less than 10 me/l, rootstocks 101-14, 110R, SO4, 1103P, and 140R can be planted. If the EC exceeds 2 dS/m, then 1103P and 140R rootstocks are suitable. If the EC exceeds 4 dS/m, only 1103P may be suitable.

If the EC exceeds 6 to 8 dS/m and is derived largely from chloride salinity, then it is likely that none of the rootstocks currently available will survive. Regardless of the EC, if chloride levels exceed 10 mmol/L, then the vines will show leaf toxicity symptoms.

These tolerance limits have been merged with rootstock responses to Total Available Water to create the selection criteria in Table II. These data derive from our commercial experience combined with research conducted in California, Australia, South Africa, and Spain. Verification of these criteria has been obtained from Cass et al. (1996), Galet (1998), Galet (2000), Grant (1997), Pongracz (1983), Southey

**Table II. Total Available water (TAW) in the Effective Root Depth (ERD) and the most appropriate rootstock choices for a dry climate (mean annual winter rainfall less than 15 to 20 inches, minimal summer rainfall) and saline soils. ($EC_{se}$ is the electrical conductivity expressed in dS/m, and $Cl_{se}$ is the chloride concentration of a saturated soil extract.)**

| TAW in the ERD (in inches) | TAW Class Name | Rating | Rootstock choices if $Cl_{se}$ less than 10 mmol/L | | |
|---|---|---|---|---|---|
| | | | $0 < EC_{se} < 2$ | $2 < EC_{se} < 4$ | $4 < EC_{se} < 8$ |
| Less than 2 | $I_d$ | Very Low | 110R | No suitable rootstocks | No suitable rootstocks |
| 2 to 4 | $II_d$ | Low | 3309C, 1616C,101-14 | 1103P | Doubtfully 1103P* |
| 4 to 6 | $III_d$ | Moderate | 3309C,101-14 | 140R, 1616C | Possibly 1103P** |
| 6 to 8 | $IV_d$ | High | 101-14, 420A | 1616C,110R | Possibly 1103P** |
| 8 to 10 | $V_d$ | Very High | 420A | 101-14 | 1103P |
| Greater than 10 | $VI_d$ | Excessive | Not suitable for premium quality wine production | | |

* Even 1103P may not ensure premium quality fruit.

**Survival and growth of vines under these conditions will depend on the type of salinity (Cl or $SO_4$), soil properties (drainage, effective root depth, chemistry) and climate in addition to TAW and rootstock performance.

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(1992), Tee *et al* (2004), and Whiting (2003). Theo Csavas and Barbara Sebastion Caumel have recently assisted in modifications to Table II.

Since soil salinity is largely a problem found in drier climates, the TAW classes in Table II have been adjusted to accommodate vine water requirements where irrigation is more than just supplementary. This is accomplished by expanding the available water class ranges as listed in Table II in contrast to Table I. The implication of climate variation on rootstock choice will be discussed more fully in the September/October 2007 ***PWV***.

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The small vine model discussed in the earlier section on matching rootstock to TAW can be used under saline conditions if the EC is less than 4 dS/m and TAW is less than eight inches of water. The vines should be planted four feet apart in the vine row.

If the soil salinity derives predominantly from sulfate salts (usually calcium and magnesium sulfate), then salinity standards listed above can be relaxed somewhat. Unfortunately, since no research has been done on sulfate salinity tolerance, safe limits are not certain.

If the soils have an SAR (a function of the ratio of sodium to calcium magnesium that measures the chemical activity of sodium in the soil solution relative to calcium and magnesium) greater than 6 but less than 15, 101-14 rootstock can be planted as long as the EC does not exceed 2 dS/m. With an SAR greater than 15, rootstock 1103P is suitable as long as the EC does not exceed 4 dS/m.

### *Soil pH*

Soils with pH values above 7.5 frequently contain free lime, which is naturally occurring calcium carbonate. This material will co-precipitate iron (Fe), phosphorous (P), zinc (Zn), manganese (Mn), and copper (Cu), thus reducing their availability. The French discuss rootstock in these soils as a function of the percentage of free lime.

An easy method to estimate free lime is to use the "fizz test." Spray the suspected free lime with hydrochloric acid (0.1M); a small fizz (gentle effervescence) is probably 2% to 5% calcium carbonate, a large amount of fizz (violent effervescence) indicates an excess of 10% calcium carbonate (*Western States Soil Manual*, 2005).

In the lab, the Gravimetric Measurement (*Western States Soil Manual*, 2005) uses acid to generate $CO_2$ and can estimate up to 50% calcium carbonate. According to P. Galet, even the most calcareous soils in France will not exceed 40% to 43% free lime.[5] Galet recommends the following rootstocks: 0 to 4% lime, Riparia Gloire; 4 to 9%, 101-14; 9 to 14%, St. George; 14 to 20%, 420A; and 20 to 40%, 41B.

### *Summary*

The most fundamental question in rootstock selection is the amount of water available for vine growth. The relevant soil property is Total Available Water (TAW), which is calculated using all soil physical properties: texture, structure, rock content, clay plasticity, soil layer sequence, and soil type.

Soil models are available to do this calculation and can also be used to simulate the effects of ripping on TAW. The deeper the soil is ripped, the greater the vine's root volume, and the more water will be available to the vine roots for growth.

The relationship of TAW to rootstock selection using Table I is based on growing small vines (see description in the earlier section on matching rootstock to TAW).

Generally, if the soil saturation extract electrical conductivity (EC) is less than 2 dS/m and the soil chloride concentration is less than 10 me/l, rootstocks 101-14, 110R, SO4, 1103P, and 140R can be planted. If the EC lies between 2 and 4 dS/m then 1103P and 140R rootstocks are suitable. If the EC exceeds 4 dS/m, only 1103P may be suitable. If the EC exceeds 6 to 8 dS/m, few of the rootstocks currently available will probably thrive. Regardless of the EC, if chloride levels exceed 10 me/L, then the vines will show leaf toxicity symptoms.

If the soils have a SAR greater than 6 but less than 15, 101-14 rootstock can be planted as long as the EC does not exceed 2 dS/m. With an SAR greater than 15, the rootstock 1103P is suitable as long as the EC does not exceed 4 dS/m.

The small vine model discussed in relation to TAW limits can be used under saline conditions if the EC is less than 5 and the TAW is less than 8. The vines should be planted four feet apart in the row. ■

**Acknowledgments**

We thank Mike Bobbitt for assisting in constructing Figures I, II, and III; Paul Anamosa for assisting in refining rootstock suitability for TAW classes, and Theo Csavas and Barbara Sebastian Caumel for assisting in refining rootstock suitability for salinity classes.

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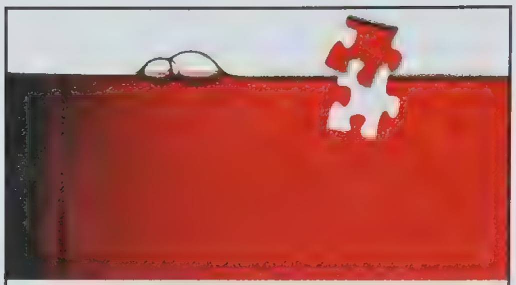

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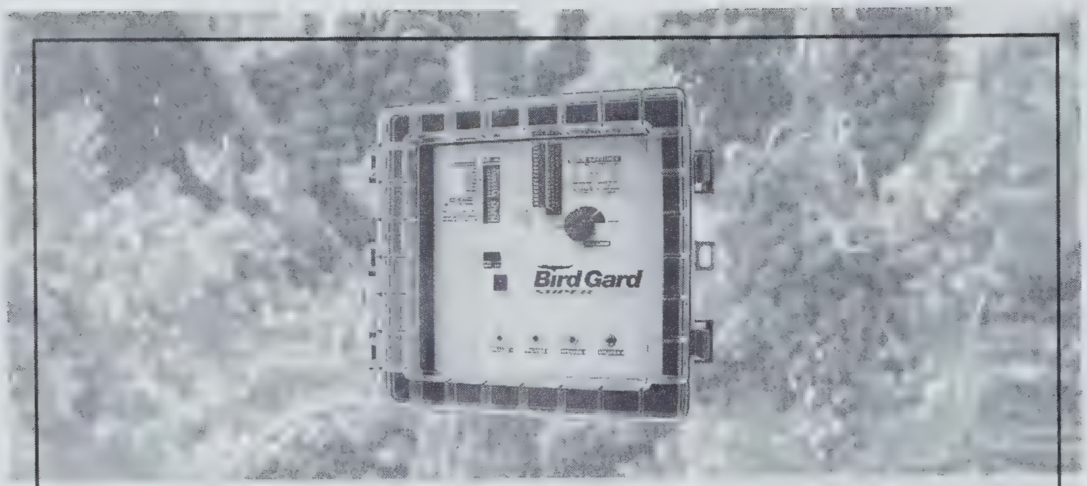

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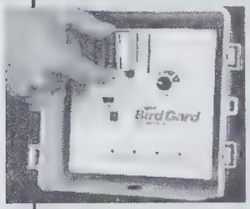

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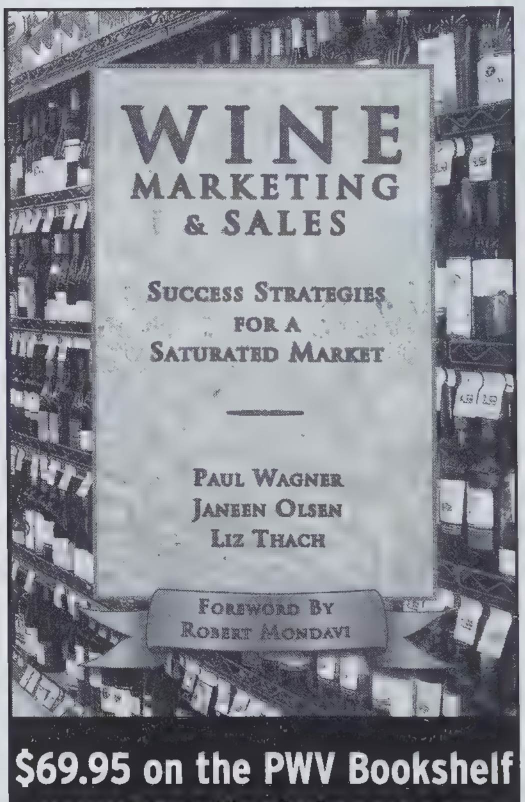

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# "Napa Valley" is first non-European geographical indication for wine registered by EU

**BY J. Scott Gerien**
**Dickenson, Peatman & Fogarty**
**Napa, CA**

On May 10, 2007, the "Napa Valley" American Viticultural Area (AVA), along with the Brazilian appellation "Vale dos Vinhedos," became the first non-European geographical indications ("GIs") for wine registered by the European Union (EU).

The journey to registration for "Napa Valley" was long and arduous and has paved the way for the registration of other AVAs and non-European appellations by the EU.

The importance of this registration to American wine regions is significant as AVAs, upon registration in the EU, will now be entitled to absolute protection in the entire European Community.

The road to registration for "Napa Valley" in the EU is instructive, underlining the importance of receiving such registration. In early 2001, the Napa Valley Vintners (NVV) began an international program of policing misuse of the Napa name.

At the international level, one of the most important tools in preventing misuse of an AVA is a provision in the General Agreement on Tariffs and Trade (GATT) Trade Related Aspects of Intellectual Property (TRIPS), which provides that every World Trade Organization member country must provide absolute protection for GIs for wines and spirits and provide mechanisms to prevent such GIs from being used or registered as trademarks for wines not from the area identified by the GI. NVV has relied on this provision of TRIPS to stop misuse of the Napa name in several countries.

In a rather ironic twist, in 2004 NVV attempted to prevent registration of the trademark Napa Ridge in the EU based upon the TRIPS GI provision. However, despite providing significant evidence as to the geographical significance of Napa Valley for wine, NVV's request to deny registration was refused on the basis that Napa Valley was not recognized by the EU as a geographical indication pursuant to its wine laws.

napa valley
vintners

While NVV and the applicant for the Napa Ridge trademark eventually resolved their dispute, this incident raised a much larger problem for NVV and its protection of the Napa name in Europe. Accordingly, NVV undertook efforts to seek registration of the Napa Valley GI in the EU. However, there was one small problem: the EU had never registered a non-European GI for wine and there was not even a procedure for non-European GIs to apply for such registration.

Undaunted, in 2005 NVV submitted documents and information to the EU Directorate General for Agriculture indicating that NVV believed that the quality, characteristics, and/or reputation of wine from Napa Valley can be attributed to the Napa Valley origin of the wine and that the Napa Valley name is uniquely associated with the region (the standard for what constitutes a GI under TRIPS).

Shortly thereafter, NVV received word that its request for GI registration was refused on the basis that there was no process for application for non-European GIs, and that a bilateral agreement between the EU and the U.S. was the only way to obtain GI protection in the EU. Believing this violated the TRIPS treaty and a recent WTO decision on GIs, NVV undertook a lobbying effort that brought it to both Washington, D.C. and Brussels, to convince the relevant authorities that this refusal should be withdrawn and that Napa Valley was entitled to registration as a wine GI in the EU.

In late 2006, NVV received unofficial word that Napa Valley would be the first non-European wine GI recognized by the EU. That recognition became official in May.

NVV can now rely on this GI registration to protect the Napa name in the EU. Any trademarks for wine filed in the EU that encompass the term "Napa" must be limited to Napa wine, based on the presumption that Napa Valley is a GI. NVV need not prove this separately in each case.

Furthermore, any wine being imported into the EU that does not properly use the Napa name may be seized at the border based upon the GI registration. Thus, NVV's enforcement of proper use of the Napa name has become significantly easier.

Despite the registration of Napa Valley as a GI in the EU, there remains no process for applying to register. The EU has vowed to design such a process; however, the EU has also indicated that the process will be part of its overall reform of the EU wine sector, which could take years.

In the meantime, NVV has paved a road for other AVAs to obtain GI registration in the EU and protect their valuable names before they can be misused by unscrupulous parties. ■

*[Scott Gerien is an intellectual property attorney with the law firm of Dickenson, Peatman & Fogarty, which serves as outside counsel to NVV. Scott is responsible for NVV's international policing efforts of the Napa name, including the registration of Napa Valley as a GI in the EU and other countries. Scott is also the Chairman of the International Trademark Association North American Committee on Geographical Indications. He may be reached at 707/252-7122 or sgerien@dpf-law.com.]*

# CLIMATE CHANGE

## Observations, projections, and general implications for viticulture and wine production

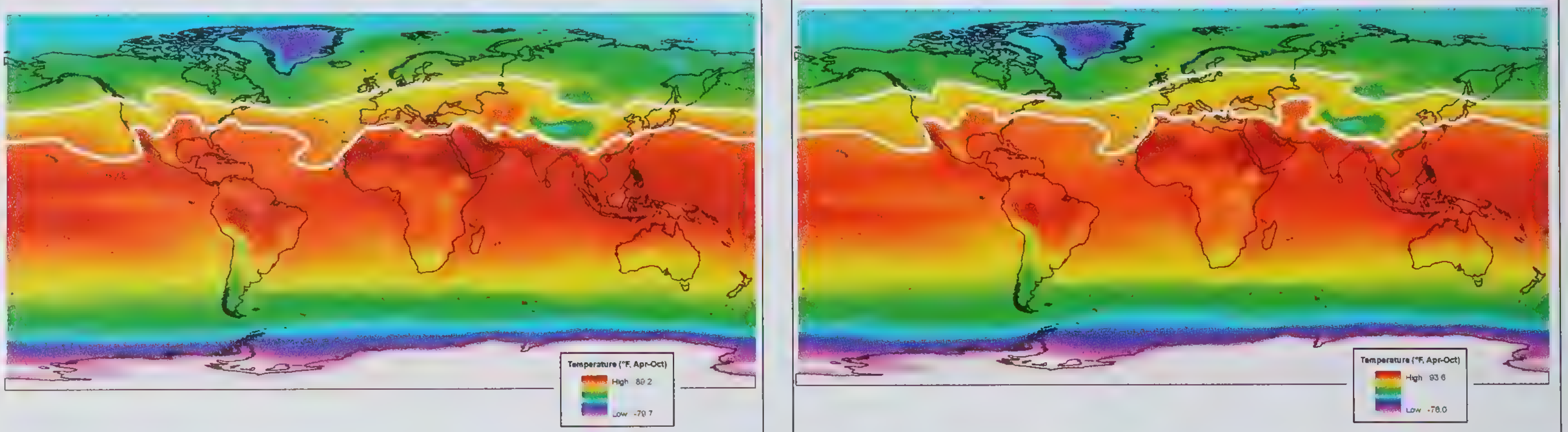
**BY Gregory V. Jones,**
**Professor, Department of Geography,**
**Southern Oregon University**

Grapevines are one of the oldest cultivated plants and, along with the process of making wine, their cultivation has resulted in a rich geographical and cultural history of development.[16,38,48] Today's viticultural regions for quality wine production are located in relatively narrow geographical and therefore climatic niches that put them at greater risk from both short-term climate variability and long-term climate change than other more broad acre crops.

In general, the overall wine style that a region produces is a result of the baseline climate, while climate variability determines vintage quality differences. Climatic changes, which influence both variability and average conditions, therefore have the potential to bring about changes in wine styles.

Northern Hemisphere 1999 Growing Season Average Temperatures (°F, Apr-Oct)

Northern Hemisphere 2049 Growing Season Average Temperatures (°F, Apr-Oct)



Southern Hemisphere 1999 Growing Season Average Temperatures (°F, Oct-Apr)

Southern Hemisphere 2049 Growing Season Average Temperatures (°F, Oct-Apr)

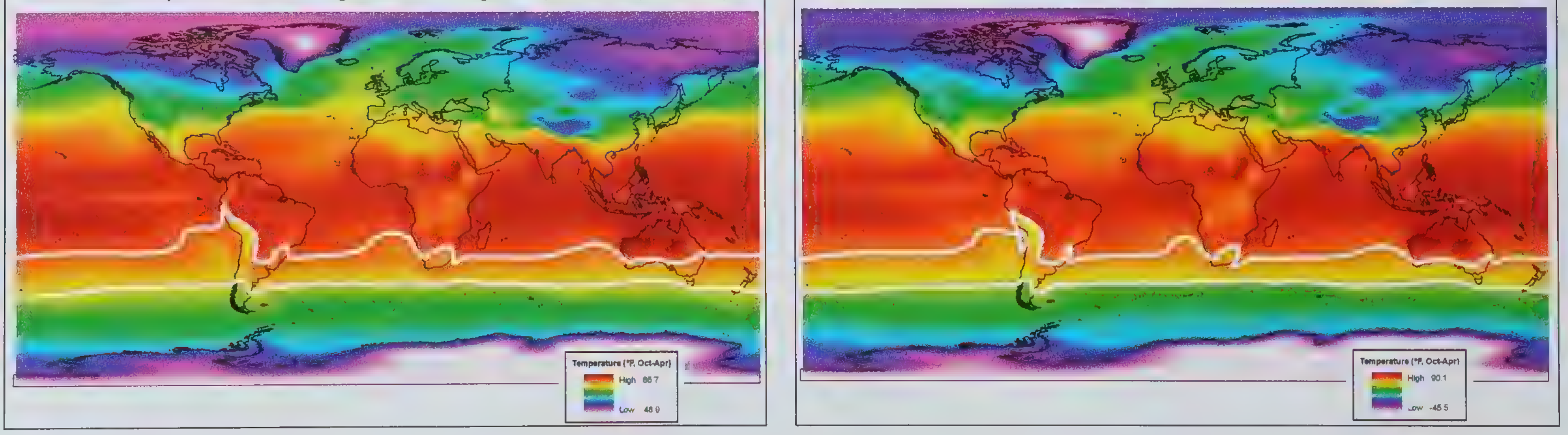


**Figure III. Maps of growing season average temperatures (Northern Hemisphere, Apr–Oct upper panels; Southern Hemisphere, Oct–Apr lower panels) derived from observations and model runs from the Community Climate System Model (CCSM). The left panel is the 1999 run and the right panel is for the 2049 run. Future projections are driven by the A1B emission scenario (moderate future consumption). The highlighted isotherms (white) are the mean 54–72°F (12–22°C) representing the latitudinal limits of the majority of the world's grape growing areas (Gladstones, 2005; Jones, 2006).**

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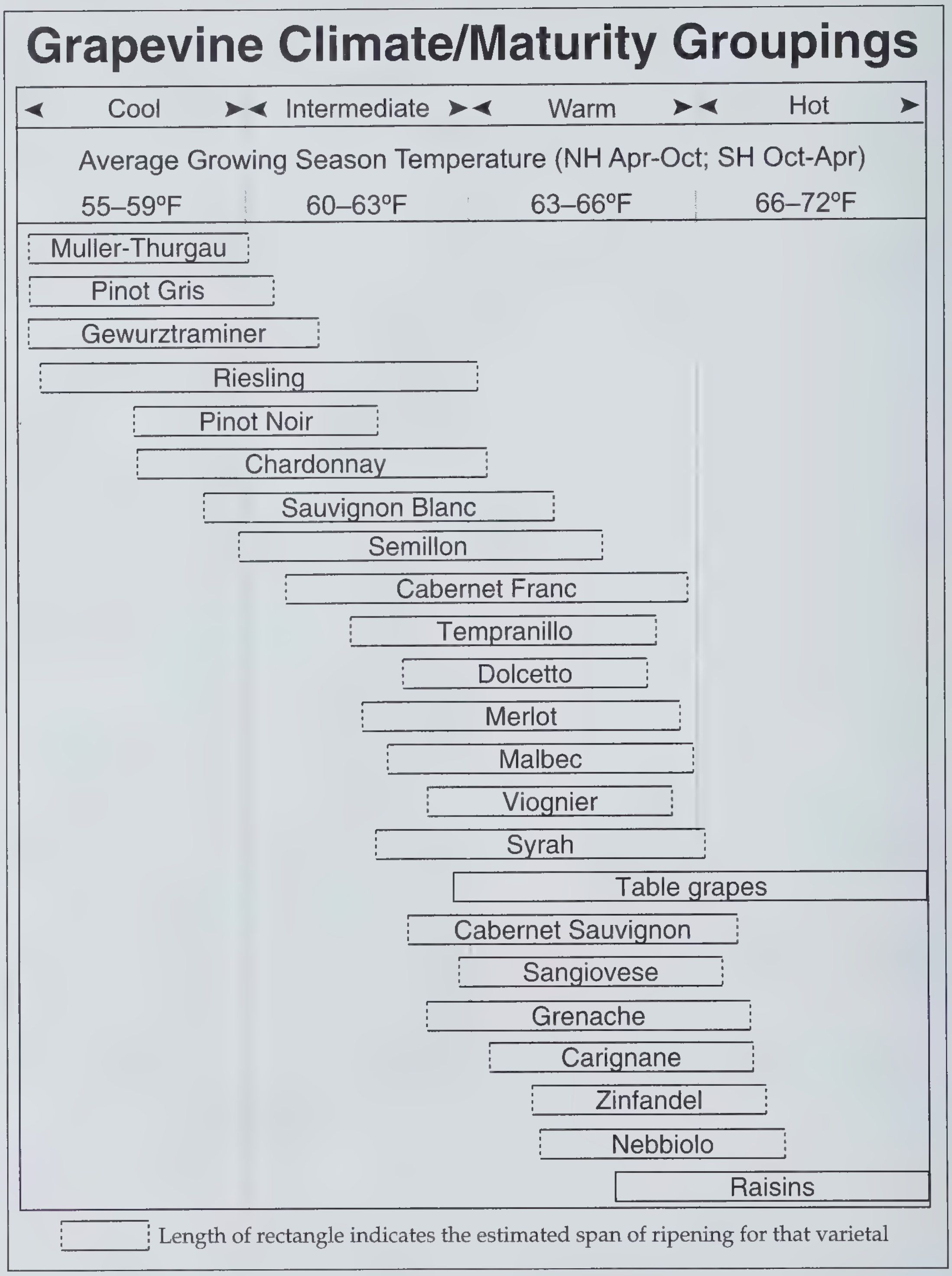

**Figure 1. The climate-maturity groupings given in this figure are based on relationships between phenological requirements and climate for high to premium quality wine production in the world's benchmark regions for each variety. The dashed line at the end of the bars indicates that some adjustments may occur as more data become available, but changes of more than +/– 0.4–0.7°F are highly unlikely. The figure and the research behind it are a work in progress (Jones, 2006).**

Our understanding of climate change and the potential impacts on viticulture and wine production has become increasingly important as changing levels of greenhouse gases and alterations in the Earth's surface characteristics bring about changes in the Earth's radiation budget, atmospheric circulation, and hydrologic cycle.[14]

Observed warming trends over the last hundred years have been found to be asymmetric with respect to seasonal and diurnal cycles, with the greatest warming occurring during the winter and spring and at night.[10,27] Observed trends in temperatures have been related to the viability of agricultural production by impacting winter hard-

### ARTICLE SYNOPSIS

Climate change has the potential to greatly impact nearly every form of agriculture. However, history has shown that the narrow climatic zones for growing winegrapes are especially prone to variations in climate and long-term climate change.

While the observed warming over the last 50 years appears to have mostly benefited the quality of wine grown worldwide, projections of future warming at the global, continental, and regional scale will likely have both beneficial and detrimental impacts.

Overall, the projected rate and magnitude of future climate change will likely bring about numerous potential impacts for the wine industry, including added pressure on increasingly scarce water supplies, additional changes in grapevine phenological timing, further disruption or alterations of balanced composition and flavor in grapes and wine, regionally-specific changes in varieties grown, necessary shifts in regional wine styles, and spatial changes in viable grape growing regions.

ening potential, frost occurrence, and growing season length.[5,10,,2030,31,37]

To place viticulture and wine production in the context of climate suitability and the potential impacts from climate change, various temperature-based metrics (such as degree-days, mean temperature of the warmest month, average growing season temperatures, etc.) can be used for establishing optimum regions.[11]

For example, average growing season temperatures typically define the climate-maturity ripening potential for premium-quality wine varieties grown in cool, intermediate, warm, and hot climates[22] (Figure I).

Cabernet Sauvignon is grown in regions that span from intermediate to hot climates with growing seasons that range from roughly 16.5 to 19.5°C (62 to 67°F), in Bordeaux or Napa.

For cooler climate varieties such as Pinot Noir, grapes are typically grown in regions that span from cool to lower intermediate climates with growing seasons that range from roughly 14.0 to 16.0°C (57 to 61°F), in Burgundy or northern Oregon.

From the general limitations that cool to hot climate suitability places on high quality wine production, it is clear that the impacts of climate change are not likely to be uniform across all varieties and regions, but are more likely to be related to climatic thresholds, whereby any continued warming would push a region outside the ability to produce quality wine with existing varieties.

For example, if a region has an average growing season temperature of 15°C (59°F) and the climate warms by 1°C (2°F), then that region is climatically more conducive to ripening some varieties, while potentially less for others. If the magnitude of the warming is 2°C (4°F) or larger, then a region may potentially shift into another climate maturity type (such as from intermediate to warm).

While the range of potential grape varieties that a region can ripen will expand in many cases, if a region is a hot-climate maturity type and warms beyond what is considered viable, then grape growing becomes challenging and maybe even impossible.

Furthermore, observations and modeling have shown that climate change will not just be manifested in changes in the mean, but also in the variance, where there are likely to be more extreme heat occurrences, but still swings to extremely cold conditions. Therefore, even if average climate structure gets better in some regions, variability will still be very evident and possibly even more limiting than what is observed today.

Overall, the wine quality impacts and challenges related to climate change and shifts in climate maturity potential will likely be evidenced mostly through more rapid plant

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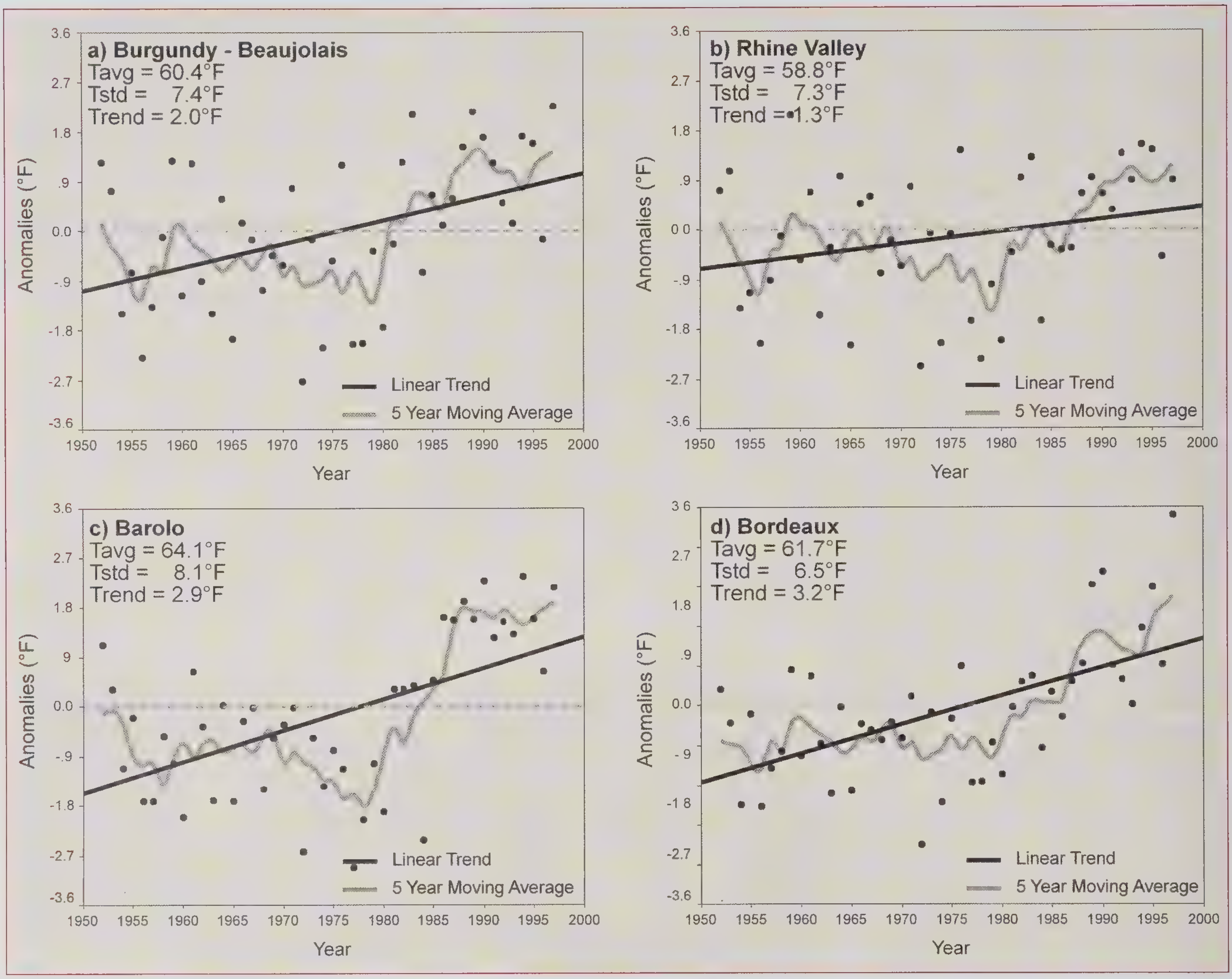

**Figure II. Observed growing season average temperature anomalies for a) the Beaujolais region of Burgundy, b) the Rhine Valley, c) Barolo, and d) Bordeaux as analyzed by (Jones et al., 2005a). The temperature data are monthly values extracted from a 0.5° x 0.5° grid centered over the wine producing regions for 1950–1999. Tavg is the average growing season temperature (Apr–Oct in the Northern Hemisphere and Oct-Apr in the Southern Hemisphere), Tstd is the standard deviation of monthly temperatures during the growing season, and the Trend is over the 50-year period.**

growth and out-of-balance ripening profiles.

For example, if a region currently experiences a maturation period (veraison to harvest) that allows sugars to accumulate to favorable levels, maintains acid structure, and produces the optimum flavor profile for that variety, then balanced wines result.

In a warmer than ideal environment, the grapevine will go through its phenological events more rapidly, resulting in earlier and likely higher sugar ripeness. While the grower or winemaker is waiting for flavors to develop, the acidity is lost through respiration, resulting in unbalanced wines without greater after-harvest inputs or adjustments in the winery. As a result, higher alcohol levels have been observed in many regions.

For example E. Duchêne and C. Schneider found that potential alcohol levels of Riesling at harvest in Alsace have increased by 2.5% (by volume) over the last 30 years. This increase was highly correlated to significantly warmer ripening periods and earlier phenology.[8]

P. Godden and M. Gishen summarized trends in composition for Australian wines.[13] While not attributing any influence to the much warmer conditions experienced in Australia today,[36,51] the wines show increases in alcohol content of 12.3% to 13.9% for red wines and 12.2% to 13.2% for white wines (1984 to 2004).

For the Napa Valley, average alcohol levels have risen from 12.5% to 14.8% (1971 to 2001) while the total acidity fell and the pH climbed.[50] While George Vierra argues that this trend is due to the tendency for bigger, bolder

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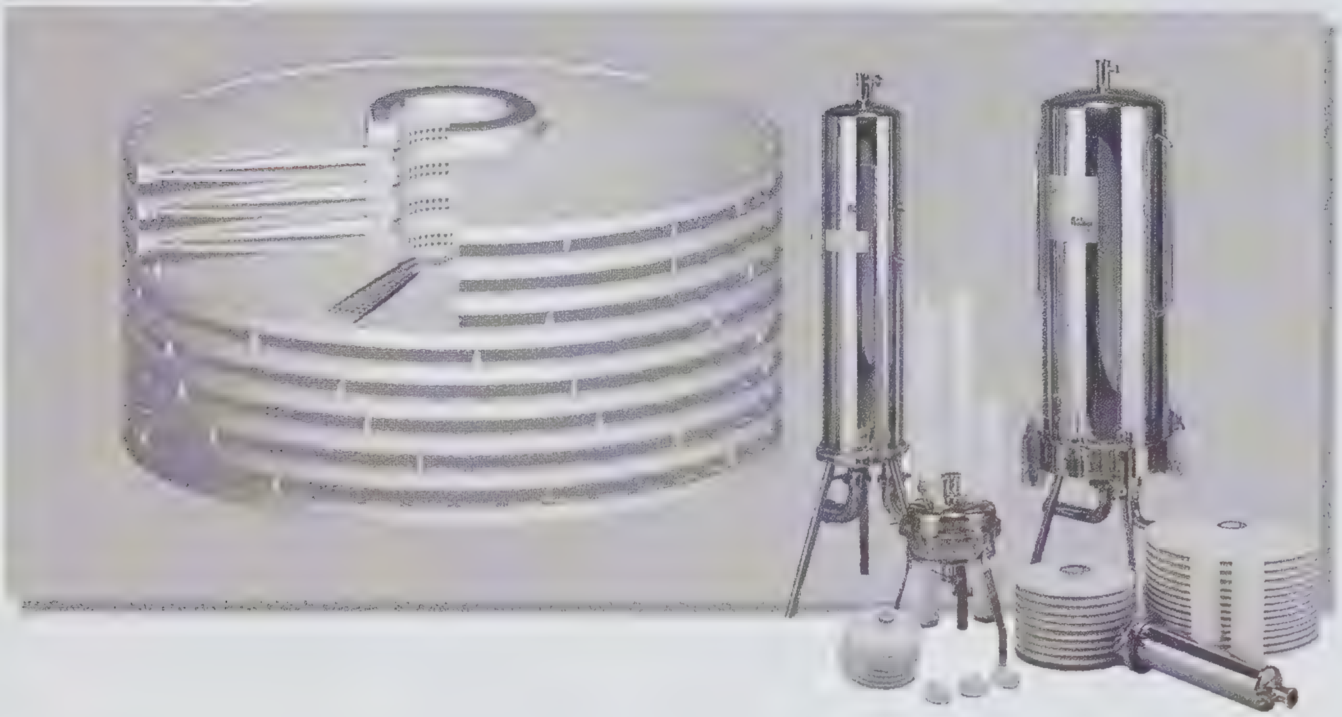

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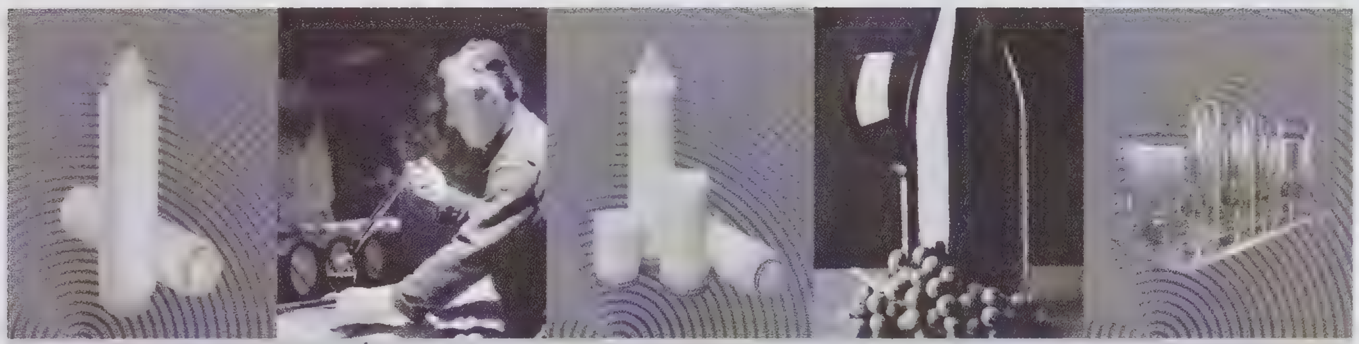

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wines driven by wine critics and the economics of vintage rating systems,[50] I have found that climate variability and change are likely responsible for over 50% of the trend in alcohol levels.

Besides changes in wine styles, one of the more germane issues related to higher alcohol levels is that wines typically will not age as well or as long as wines with lower alcohol levels. Finally, harvests that occur earlier in the summer, in a warmer part of the growing season (August or September instead of October in the Northern Hemisphere) will result in hotter harvested fruit and potentially desiccated fruit without greater irrigation inputs.

### *Historical observations of wine region climates*

History has shown that winegrape growing regions developed when the climate was most conducive and that shifts in viable wine-producing regions have occurred due to climate changes, making production more difficult or easier.[11,33,39]

In Europe, records of dates of harvest and yield have been kept for nearly one thousand years,[33,38] revealing periods with more beneficial growing season temperatures, greater productivity, and arguably better quality in some regions.

Other evidence has shown that vineyards were planted as far north as the coastal zones of the Baltic Sea and southern England during the medieval "Little Optimum" period (roughly 900 to 1300 AD) when temperatures were up to 1.8°C (3.2°F) warmer.[11]

During the High Middle Ages (12th and 13th centuries) harvesting occurred in early September as compared to early to mid-October today, and growing season temperatures must have been at least 1.7°C (3°F) warmer than those experienced today.[11,39]

However during the 14th century, dramatic temperature declines led to the "Little Ice Age" (extending into the late 19th century), which resulted in most of the northern vineyards dying out and growing seasons that were so short that harvesting grapes in much of the rest of Europe was difficult.

In addition, research has used contemporary grape harvest dates from Burgundy to reconstruct spring/summer temperatures from 1370 to 2003. While the results indicate that temperatures as high as those reached in the warm 1990s have occurred several times in the region since 1370, the temperatures in the extremely warm summer of 2003 appear to have been higher than in any other year since 1370.[7]

My recent research into the impacts of climate change on wine quality analyzed growing season temperatures in 27 of arguably the best wine producing regions in the world and found that average growing season temperatures warmed 1.3°C (2.3°F) over the last 50 years.[18]

However, the warming was not uniform across the regions, with greater magnitudes in the western U.S. and Europe, and less warming in Chile, South Africa, and Australia. The greatest warming was seen in the Iberian Peninsula, southern France, and parts of Washington and California, with warming greater than 2.5°C (4.5°F).

Figure II provides examples of the observed warming for the Burgundy (Beaujolais), Rhine Valley, Barolo, and Bordeaux regions with 1950–1999 warming trends ranging from 0.7 to 1.8°C (1.3 to 3.2°F). The study also found that vintage ratings in these same regions have shown trends of increasing overall quality with less vintage-to-vintage variation and that growing season temperatures were important factors in vintage ratings across many regions, albeit not uniform across the regions and not always linear.[35,44]

Depending on the region and wine type, the marginal effects of the growing season temperatures show that a 1°C (1°F) warmer vintage can result in 10 to 22 (6 to 12) point rating increases.[18]

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However, the research also notes that the role of factors other than growing season temperatures, such as technology and familiarity, are important factors in vintage ratings.

Furthermore, the research found that climate thresholds are evident in many regions where, once beyond a given growing season temperature, quality declines are seen. Therefore, the general rule of thumb "the warmer the better" does not apply for all wine regions where some are near or at the optimum growing season temperatures for achieving the highest quality wine.

More regionally specific and temporally resolved analyses concur with the global observations of wine region temperature trends.[17,19,20] Overall, during the last 30 to 70 years many of the world's wine regions have experienced a decline in frost frequency, shifts in the timing of frosts, and warmer growing seasons with greater heat accumulation.

In North America, research has shown significant changes in growing season climates, especially in the western U.S. For example, during 1948–2002 in the main grape growing regions of California, Oregon, and Washington, growing seasons have warmed by 0.9°C (1.6°F), driven mostly by changes in minimum temperatures, with greater heat accumulation, a decline in frost frequency that is most significant in the dormant period and spring, earlier last spring frosts, later first fall frosts, and longer frost-free periods.[20]

Temporal changes for the Napa Valley since 1930 show that heat accumulation is over 350°C units (630°F units) and has been the result of significant warming at night where the minimum temperatures have climbed 3.0°C (5.4°F) while daytime temperatures have not changed significantly.[25]

Precipitation amounts and timing are highly variable in the western U.S., being more tied to larger-scale climate variability mechanisms such as El Niño or the Pacific Decadal Oscillation than to structural trends.[25]

A focused study for locations in Napa Valley and Sonoma Valley of California found that higher yields and quality over the last 50 years were influenced by asymmetric warming (at night and in the spring) where a reduction in frost occurrence, advanced initiation of growth in the spring, and longer growing seasons were the most influential.[37]

In addition, recent analyses of wintertime extreme freeze events for two important growing regions in North America — eastern Washington and the Niagara Peninsula of Canada — reveal that although there has been some warming in moderate minimum temperature levels (days with temperatures less than 32°F), extreme low temperatures (–5°C or 23°F — or less) have

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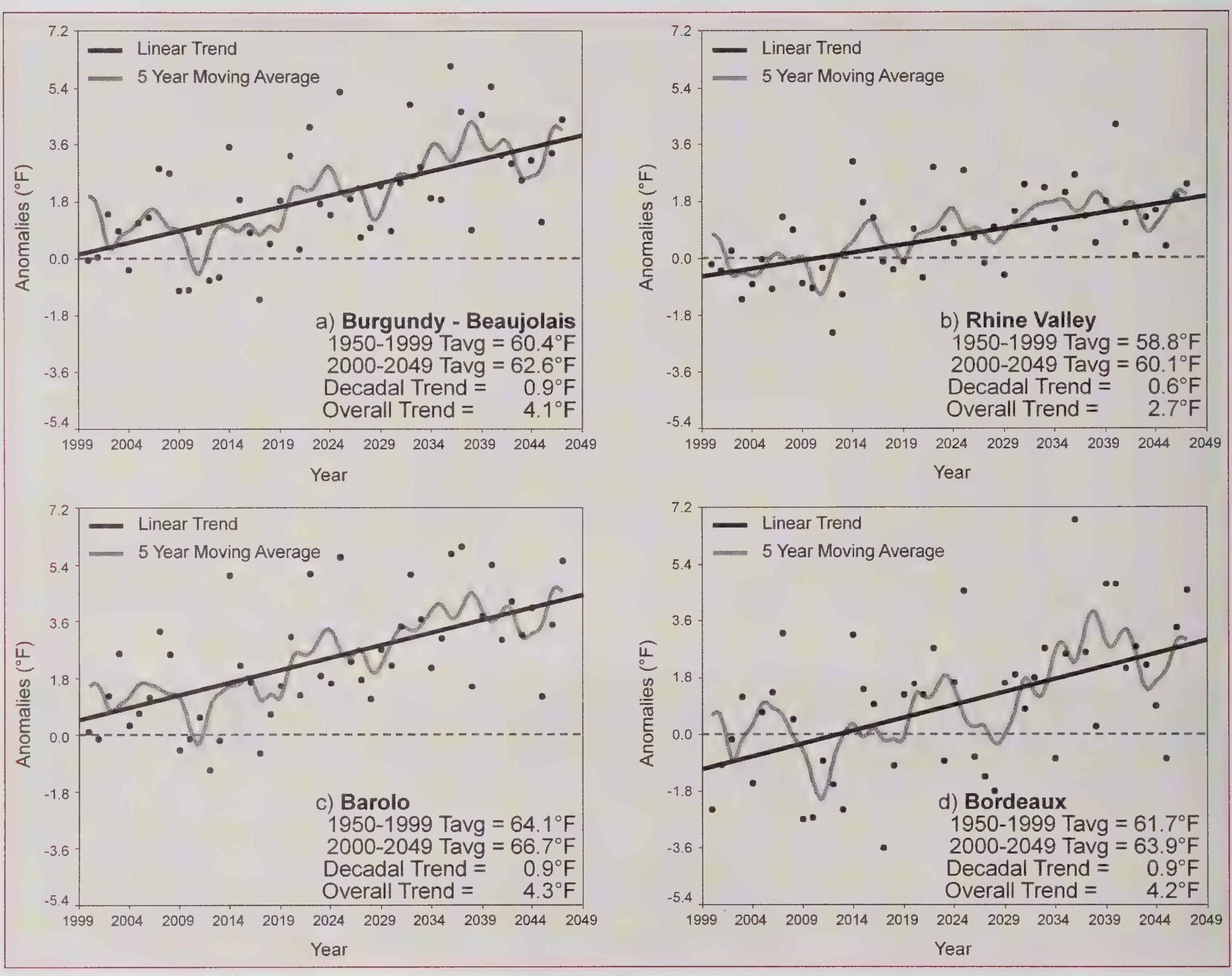

**Figure IV. Modeled growing season average temperature anomalies for a) the Beaujolais region of Burgundy, b) the Rhine Valley, c) Barolo, and d) Bordeaux as analyzed by (Jones et al., 2005a). The modeled temperature data are from the HadCM3 climate model on a monthly time scale extracted from a 2.5° x 3.75° grid centered over the wine producing regions for 2000–2049. The anomalies are referenced to the 1950–1999 base period from the HadCM3 model. Trend values are given as an average decadal change and the total change over the 50-year period.**

not changed in frequency over the last 75 years.[24]

Furthermore, from the limited data available across the U.S., observed changes in grapevine phenology have been on the order of two to five days earlier per decade over the last 25 to 35 years depending on variety and region, and are strongly correlated to warmer springs and summers.[24,53]

Recent research for Europe has shown results similar to those found in North America detailed above.[19] An examination of climate and phenology trends over the last 30 to 50 years for 11 locations across a range a climate types in Europe (cool to warm) and for 16 varieties shows that warming has occurred across most seasons, but is strongest in the spring and summer.

Growing seasons over the studied locations have warmed by 1.7°C (3°F) on average, with most of the warming occurring at night. Heat accumulation has increased also, with degree-days rising by 250 to 300°C units (450 to 500°F units), while precipitation frequency and amounts have not changed significantly.

Specifically for Spain, the growing seasons have warmed on average by 0.8 to 1.2°C (1.4 to 2.2°F) for the Galicia and Valladolid regions with the warming being much more significant at night (minimum temperatures increasing 1.1 to 2.1°C (2.0 to 3.8°F) than during the day (not significant).[19] Heat accumulation, either measured by the Huglin Index or Winkler Index (see below), has increased inland, but has not

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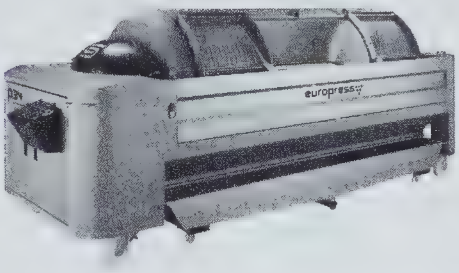

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changed significantly in the more coastal region of Galicia.

Grapevine phenological timing in Europe has showed strong relationships with the observed warming, with trends ranging 6 to 25 days earlier over numerous varieties and locations.[19] Changes are greatest for veraison and harvest dates, which typically show a stronger, integrated effect from a warmer growing season.

Interval lengths between the main phenological events have also declined, with bud break to bloom, veraison, or harvest dates shortening by 14, 15, and 17 days, respectively. Averaged over all locations and varieties, grapevine phenology shows a five to 10-day response per 1°C (three to six-day response per 1°F) of warming over the last 30 to 50 years.

### *Model projections of wine region climates*

Projections of future climates are produced through models based upon knowledge of how the climate system works, and used to examine how the environment — in this case viticulture and wine production, are likely to respond to these changes.

These climate models are complex 3-D, mathematical representations of our Earth/atmosphere system that represent spatial and temporal analyses of the laws of energy, mass, moisture, and momentum transfer in the atmosphere and between the atmosphere and the surface of the Earth. Additionally, climate models are based upon IPCC emissions scenarios, which reflect estimates of how humans will emit $CO_2$ in the future.[14]

The many models in use today, combined with the fact that they are modeling a non-linear system and using different emission scenarios, result in a range of potential changes in temperature and precipitation for the planet.[14]

Work over the last 30 years using model projections shows that the observed warming trends in wine regions worldwide are predicted to continue. In one of the early analyses of the impacts of climate change on viticulture, it was suggested that growing seasons in Europe should lengthen and that wine quality in Champagne and Bordeaux should increase.[34]

These results have largely been proven correct. Furthermore, spatial modeling research has also indicated potential shifts and/or expansions in the geography of viticulture regions. Parts of southern Europe are predicted to become too hot to produce high-quality wines and northern regions will become more stable in terms of consistent ripening climates and/or being viable grape growing regions once again.[4,28]

Examining specific varieties (Sangiovese and Cabernet Sauvignon), M. Bindi found that climate change in Italy should lead to shorter growth intervals but increases in yield variability.[2]

Other studies of the impacts of climate change on grape growing and wine production reveal the importance of changes in the geographical distribution of viable grape growing areas due to changes in temperature and precipitation. These studies also predict greater pest and disease pressure due to milder winters and changes in sea level potentially altering the coastal zone influences on viticultural climates, and they note the effect that increases in $CO_2$ might have on grape quality and the texture of oak wood which is used for making wine barrels.[36,41,43,46]

At the broadest scale of global suitability for viticulture, it has long been considered that viticulture zones are found between either the mean annual 10 to 20°C isotherms (50 to 68°F) or the growing season 12 to 22°C isotherms.[12,22] However, I found that the growing season criterion is more valid as the 12 to 22°C (54 to 72°F) isotherm zone more completely encompasses the world's viticulture regions (not shown).[2]

To examine the global latitudinal limitations of viticulture suitability due to climate, I used output from the Community Climate System Model (CCSM) on a 1.4° x 1.4° latitude/longitude resolution and B1 (moderate), A1B (mid-range), and A2 (high) emission scenarios to depict the 12 to 22°C (54 to 72°F) isotherm shifts for three time periods: 1999, 2049, and 2099.[23]

Changes from the 1999 base period show shifts in the amount of area suitable for viticulture and a general latitudinal shift poleward (Figure III). By 2049, the 54°F and 72°F isotherms shift 95 to 185 miles poleward in both hemispheres depending on the emission scenario (see Figure III for the mid-range A1B scenario). By 2099, the isotherms shift an additional 80 to 16 miles poleward.

The shifts are marginally greater on the poleward fringe compared to those on the equatorial fringe in both hemispheres. However, the relative area of land mass that falls within the isotherms across the continents expands in the Northern Hemisphere while contracting in the Southern Hemisphere due to land mass differences (Figure III). Similar shifting is seen by 2099 for all scenarios (not shown in Figure III).

Using Hadley Centre climate model (HadCM3) output and an A2 emission scenario[40] to 2049 for 27 of the world's top wine producing regions, I compared the average climates of two periods, 1950–1999 and 2000–2049.[18] The results suggest that mean growing season temperatures will warm by an average 1.3°C (2.3°F) over the wine regions studied, with Burgundy (Beaujolais), Rhine Valley, Barolo, and Bordeaux differences ranging from 0.9 to 1.4°C (1.6 to 2.5°F). The results are shown in Figure IV.

Also, the projected changes are greater for the Northern Hemisphere (1.3°C or 2.3°F) than the Southern Hemisphere (0.9°C or 1.6°F). Examining the **rate of change** projected for the 2000–2049 period only reveals significant changes in each wine region with trends ranging from 0.2 to 0.6°C (0.4 to 1.1°F) per decade.

Overall trends during the 2000–2049 period average 2°C (3.6°F) across all regions, with the smallest warming in South Africa (0.9°C or 1.6°F over 50 years) and the greatest warming in Portugal (2.9°C or 5.2°F over 50 years). For the Burgundy (Beaujolais), Rhine Valley, Barolo, and Bordeaux regions, decadal trends are modeled at 0.3 to 0.5°C (0.5 to 0.9°F) while the overall trends are predicted to be 1.5 to 2.4°C (2.7 to 4.3°F). See Figure IV.

In addition, I showed that many of the wine regions may be at or near their optimum growing season temperature for high-quality wine production and further increases, as predicted by the differences between the means of the 1950–1999 and 2000–2049 periods, will place some regions outside their theoretical optimum growing season climate.[18]

The magnitude of these mean growing season changes indicate potential shifts in climate maturity types for many regions at or near a given threshold of ripening potential for varieties currently grown in that region.

In Figure I, Bordeaux's growing season climate of the last 50 years averaged 16.5°C (61.7°F); add to it the overall trend in projected warming in Bordeaux of 2.3°C (4.1°F) by 2049. An 18.8°C (65.8°F) average growing season would place Bordeaux at the upper end of the optimum ripening climates for many red varieties grown there today, and outside the ideal climates for the main white varieties grown.

More evidence of these impacts come from the Napa Valley, where a 17.5°C (63.5°F) historical average is projected to warm by 2.2°C (4.0°F) to 19.7°C (67.5°F) by 2049. This would place Napa Valley at the upper end of optimal ripening climates for nearly all of the most common varieties (Figure I).

The results also show warming during the dormant periods, which could influence hardening potential for latent buds, but observations and models indicate continued or increased seasonal variability, which could spell problems in freeze- or frost-prone regions.

For the United States as a whole, M.A. White used a high-resolution (25 km) regional climate model forced by an IPCC A2 greenhouse gas emission scenario and estimated that potential premium winegrape production area in the contiguous U.S. could decline by up to 81% by the late 21st century.[52] The research found that increases in heat accumulation will likely shift wine production to warmer climate varieties and/or lower-quality wines.

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Additionally, the models show that while frost constraints will be reduced, increases in the frequency of extreme hot days (more than 35°C or 95°F) in the growing season are projected to completely eliminate winegrape production in many areas of the U.S. Furthermore, grape and wine production will likely be restricted to a narrow West Coast region and the Northwest and Northeast, areas where excess moisture is already problematic.[52]

From a more regional analysis, I examined suitability for viticulture in the western U.S., which has long been based on a standard heat summation formulation originally proposed by M. A. Amerine and A. J. Winkler (1944).[26] Winkler regions are defined by growing degree-days using a base of 10°C (50°F) over the growing season of April–October. The resulting five regions show broad suitability for viticulture across cool to hot climates and the varieties that grow best in those regions.

To depict spatial variations in degree days, the Daymet model covering data from 1980 to 2003 at a 1 km resolution[47] shows that the cooler region I is found higher in elevation, more coastal, and more northerly (such as the Willamette Valley) while the warmest region V areas are mostly confined to the Central Valley and further south in California (Figure V).

Averaged over the 1980–2003 time period, 34% of the western U.S. falls into regions I–V with 59% being too cold (less than 1111°C or 2000°F units) and 7% too hot (more than 2778°C or 5000°F units).

Separated into individual regions, region I encompasses 34.2%, region II (20.8%), region III (11.1%), region IV (8.7%), and region V (25.2%). Therefore the western U.S. is predominately at the margins of suitability, with 59.4% in the coolest and hottest regions (regions I and V, respectively).

Using projections for increases in average growing season temperatures from the Community Climate System Model (CCSM) of 1.0 to 3.0°C (1.8 to 5.4°F) for 2049 results in a range of increases in growing degree-days of 15 to 30% (Figure V). At a +2.0°F warming (roughly a 15% increase in growing degree days), the area of the western U.S. in regions I–V increases 5% from 34% to 39% and at the higher range of a +5.0°F warming (roughly a 30% increase in growing degree days), increases by 9% to 43%.

Overall, the changes show a reduction in the areas that are too cold from 59% to 41% while the areas that are too hot increase from 7% to 16% in the greater warming scenario.[26] Similarly, in individual regions there are shifts to predominately more land in region I (34.2% to 40.6%), smaller changes to

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region II (20.8% to 23.4%), region III (11.1% to 14.2%), and region IV (8.7% to 10.1%), and a reduction of region V area from 25.2% to 11.6%.

Spatially, the shifting of regions occurs toward the coast, especially in California, and upward in elevation — most notably in the Sierra Nevada Mountains. Other regions show large-scale shifting from one Winkler region to another (such as Willamette Valley shifting from predominately region I to region II).

In another regional analysis for the west coast of the U.S., D.B. Lobell *et al.* examined the impacts of climate change on yields of perennial crops in California.[26] The research combined the output from numerous climate models (testing climate uncertainty) with multiple statistical crop models (testing crop response uncertainty) for almonds, walnuts, avocados, winegrapes, and table grapes.

The results show a range of warming across climate models of 1.0 to 3.0°C (1.8 to 5.4°F) for 2050 and 2.0 to 6.0°C (3.6 to 10.8°F) for 2100, and a range of changes in precipitation from –40 to +40% for both 2050 and 2100.

Winegrapes showed the smallest yield declines compared to other crops, but showed substantial spatial shifts in suitability to more coastal and northern counties. The authors also note that yield trends have low attribution to climate trends and are more due to changes in technology (mostly) and an increase in $CO_2$ (likely).

Other regional work in Europe,[4,28,45] Australia,[36,51] and South Africa[6] has examined climate change through different modeling approaches, but has come up with similar results.

G.J. Kenny and P.A. Harrison did some of the early spatial modeling of future climate change impacts on viticulture in Europe and indicated potential shifts and/or expansions in the geography of viticulture regions with parts of southern Europe predicted to become too hot to produce high-quality wines and northern regions becoming viable once again.[28]

Examining changes in the Huglin Index of suitability for viticulture in Europe, M. Stock shows increases of 100 to 600°C units (180 to 1080°F units) that result in broad latitudinal shifts, with new areas on the northern fringes becoming viable, changes in varietal suitability in existing regions, and southern regions becoming so hot that overall suitability is challenged.[45]

In Spain, J.M. Rodriguez examined different emission scenarios to place lower and upper bounds on temperature and precipitation changes and found trends of 0.4 to 0.7°C (0.7 to 1.3°F) per decade with summer warming greater than in the winter.[42] Overall, the changes result in warming by 2100 of between 5 to 7°C (9 to 13°F) inland and 3 to 5°C (5 to 9°F) along the coast. Concomitant with these temperature

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projections, Rodriguez shows much drier springs and summers and lower annual rainfall, which is less homogeneous across Spain than is temperature.[42]

To examine grapevine responses to climate change, E. Lebon used model output to show that the start of Syrah ripening (veraison) in southern France would shift from the second week of August today to the third week of July with a 2°C (3.6°F) warming and to the first week of July with a 4°C (7.2°F) warming.[32] Additionally the research found that significant warming during maturation and especially at night would disrupt flavor and color development and ultimately the wine's typicity.[32]

In Australia, L. B. Webb et al. analyzed climate change scenarios for viticulture showing that temperatures by 2070 are projected to warm in Australia by 1.0 to 6.0°C (1.8 to 10.8°F), increasing the number of hot days and decreasing frost risk, while precipitation changes will be more variable but will result in greater growing season stress on irrigation.[51]

The changes projected for Australia have tied future temperature regimes to reduced wine quality, with southerly and coastal shifts in production regions being the most likely alternative to maintain viability.

In South Africa, regional projections of rising temperatures and decreased precipitation are projected to put additional pressure on both the phenological development of the vines and on the necessary water resources for irrigation and production.[6] The research implies that the practice of winemaking in South Africa is likely to become riskier and more expensive, with the most likely effects being shifts in management practices to accommodate an increasingly limited water supply.

S. Carter notes that the situation in South Africa will likely exacerbate other economic issues such as increases in the price of wine, a reduction in the number of wine growers, and the need for implementation of expensive and yet unknown adaptive strategies.[6]

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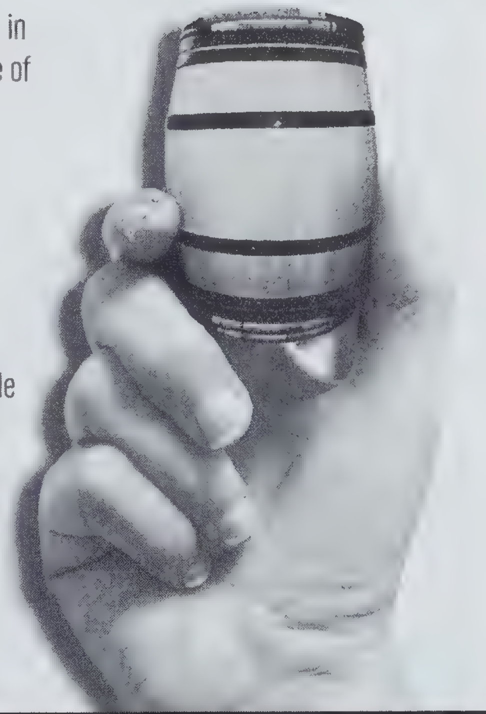

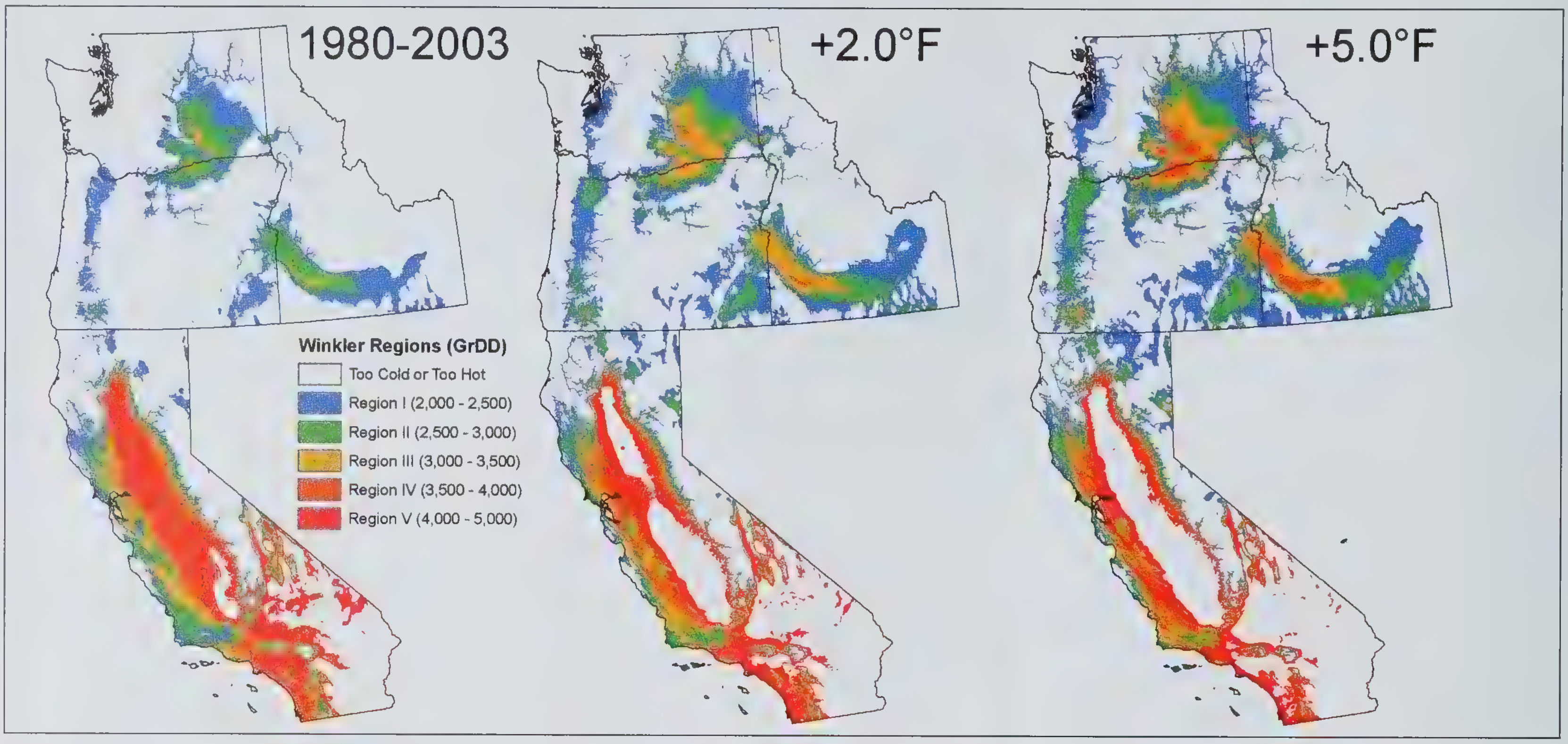

Figure V. Winkler Regions for the western U.S. based on Daymet (Thornton et al., 1997) daily 1 km resolution daily temperature data (growing degree-days, base 50°F over Apr–Oct). The left panel is the average over the 1980–2003 time period. The middle panel is a projection of a +2.0°F increase over 1980–2003 (low range of projected climate change by 2049). The right panel is a projection of a +5.0°F increase over 1980–2003 (high range of projected climate change by 2049).

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Together these studies, and those detailed previously, indicate that the challenges facing the wine industry include more rapid phenological development, changes in suitable locations for some varieties, a reduction in the optimum harvest window for high-quality wines, and greater management of already scarce water resources.

### *Overview / Implications*

It is clear from recorded history and proxy records that the climates of the Earth have varied and changed on both long and short timescales.[33,39] These variations have driven viability in many agricultural systems including viticulture and wine production where, in general and even more specifically for individual varieties, there are narrow climatic optimums that provide limited geographical zones of suitability.

The observed warming over the last 50 years appears to have been largely beneficial for viticulture in many regions through longer and warmer growing seasons with less risk of frost. However, the trends have been shown to be more influential on the poleward fringes by providing more consistent ripening climates for existing varieties, making warmer climate varieties more viable, or opening up once forgotten regions again.

On the other extreme, already hot regions have experienced warmer and generally drier conditions that have produced challenges in ripening balanced fruit. Concomitant with the warming trends have come better technology, better plant material, and better vineyard management, and these adaptations have allowed growers to meet some of these challenges.

However, the projections show that future climate change will likely be more rapid and to a greater magnitude than our ability to adapt without increased understanding of the impacts and advances in plant breeding and genetics.[3,49]

Overall, climate change is one of the most studied and debated scientific issues today. While it is clear from historical evidence that changing climates are a part of the Earth's natural adjustments to both internal and external forces, more and more evidence is pointing to increasing human impacts on our climate.

From processes such as desertification, deforestation, and urbanization where the global energy balance is disrupted, to changes in atmospheric composition, which enhances the greenhouse effect beyond its natural equilibrium, humanity's role in climate change is increasing. From the latest Intergovernmental Panel on Climate Change "Summary for Policymakers,"[15] the following statements express our current state of knowledge:

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>
> "Anthropogenic warming and sea level rise would continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized."

Given this knowledge, society's role should now shift from one of uncertainties, blame, or attribution to one of mitigation and adaptation. While the wine industry has some leeway to mitigate fossil fuel use and sequester carbon through more efficient processes both in the vineyard and winery, the bulk of the response will likely be through adaptation.

Because we know that winegrapes can only be grown across a fairly narrow range of climates for optimum quality and production, it all depends on where a region is today in terms of climate and the magnitude and rate of the future warming.

Observations show, and models predict that one of the most important issues for the wine industry will be whether achieving optimum varietal ripeness and wine balance is possible in the warmer environment or whether we will be forced to change varieties or shift regions to achieve the same wine styles.

Referring back to Figure I, note that varietal suitability has a window of only 2 to 3°C (3.5 to 5.5°F) and that the projections of temperature changes for wine regions around the world range from 1 to 7°C (2.0 to 12°F) . Changes of these magnitudes have the potential to bring about large shifts in suitability.

While most of the discussion has been focused on temperature-related impacts, other potential issues affecting grape and wine quality include changes in vine growth due to a higher $CO_2$ concentration in the atmosphere, increased moisture stress in water-limited regions, and changes in the presence or intensity of pests and vine diseases.

Even with our current state of knowledge, much uncertainty still exists in the exact spatial and temporal nature of changes in climate. Therefore the wine industry will need to be proactive in assessing the impacts, ready to implement appropriate adaptation strategies, and willing to alter varieties and management practices or mitigate wine quality differences by developing new technologies. However, probably the greatest adaptation challenge will be how we respond culturally to changes in regional identities due to variety changes or wine style changes.

While the ***exact*** spatial changes in the magnitude and rate of climate in the future are speculative at this point, what is absolutely clear from historical observations and modeling is that the climates of the future, both over the short term and over the long term, will be different than those today.

Can we remain steadfast in our approaches to growing winegrapes, or any crop for that matter? Likely not. It will be those sectors of agriculture that are the most aware, that experiment with both methods and technology — in plant breeding and genetics, in the field, and in processing — that will have the greatest latitude of adaptation. ■

### Acknowledgments

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# Oxygen transmission through different closures into wine bottles

BY Paulo Lopes*, Cédric Saucier, Pierre-Louis Teissedre, Yves Glories

Ageing of wine is extremely dependent on the amount of oxygen a wine receives during the winemaking process.[1] Opportunities for oxygen exposure include contact during vinification prior to bottling, oxygen pick up during transfer to the filler, in the bottling line, in the headspace (dependent of volume, pressure, and gas composition), and oxygen ingress through the closure during post-bottling storage. The latter depends on the oxygen barrier provided by the closure used.

To summarize our experiment, a non-destructive (a single bottle can be analyzed without compromising the closure seal) colorimetric method was developed to measure oxygen ingress from 0.25 to 2.5 mL into wine bottles. This method infers oxygen ingress through a closure by direct colorimetric scan of flint wine bottles (375 mL) containing indigo carmine solutions that gradually changes color from yellow to indigo as oxygen reacts with the reduced indigo carmine. This method measures the oxygen

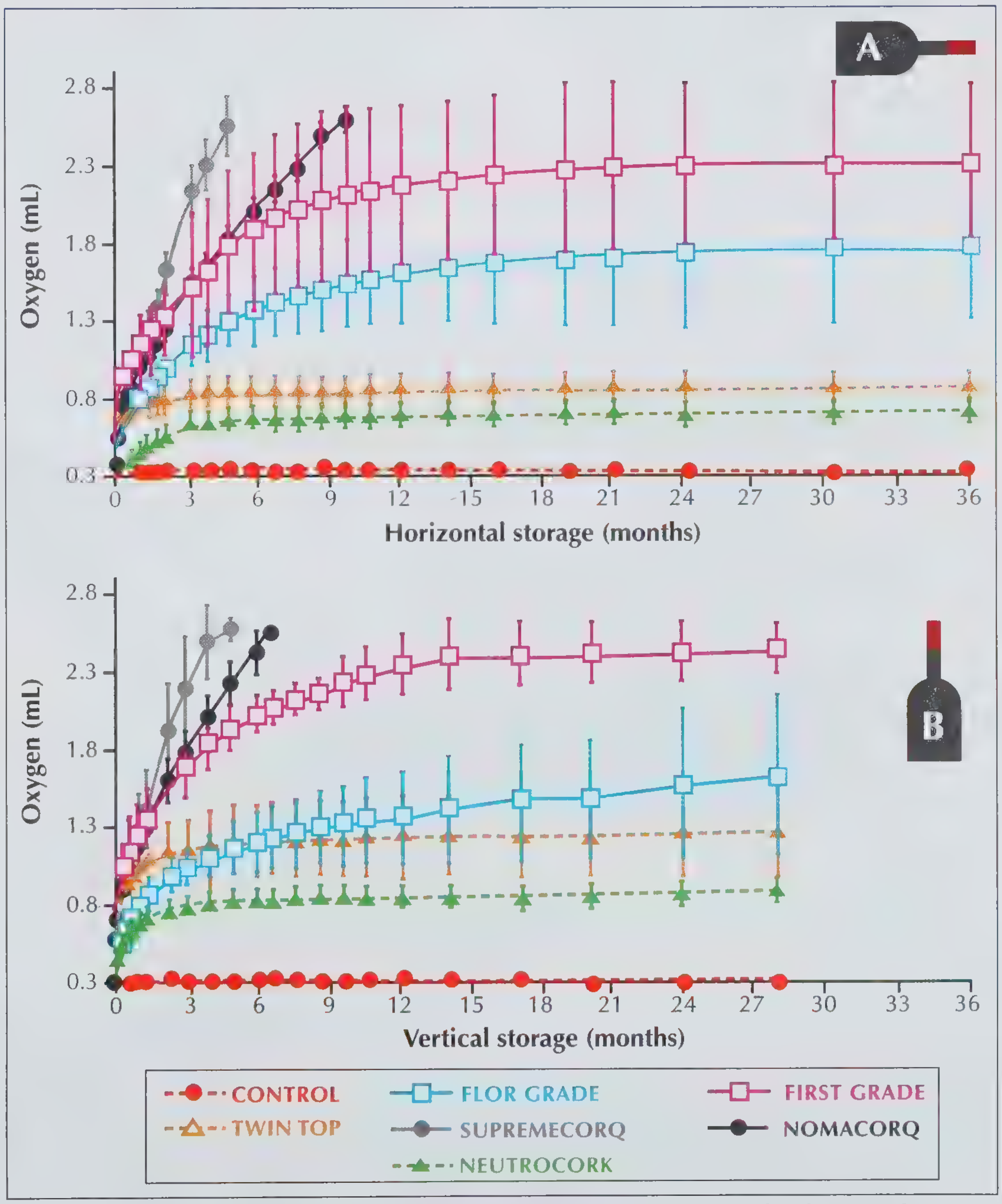

**Figure I. Kinetics of oxygen ingress through different closures into wine bottles stored in horizontal position over 36 months (A) and vertical position over 28 months (B). Error bars represent the standard deviation of four replicates.**

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ingress through different closures over the time under identical conditions to wine bottle ageing. Details concerning this methodology are provided in Lopes *et al.*[2]

Closures tested include: two natural cork stoppers (45 x 24 mm), the best grade ("flor"), and the intermediate grade (first); two "technical" cork stoppers (Twin Top and Neutrocork ); two synthetic closures, Nomacorc classic closure (43 x 22 mm) and Supremecorq 45™; and four different screw-cap (saran-tin liners) closures (Stelvin, Auscap, Cospak, and CSA).

An airtight bottle containing a reduced indigo carmine solution, sealed by flame, was used as a control. Four bottle replicates of each of the sealing systems were assessed. All bottles were sealed and then stored horizontally and vertically under constant temperature of 20 +/-1°C and constant relative humidity of 65 +/-1%. More details regarding closures, bottling, and storage conditions are available in Lopes *et al.*[3]

**Table I: Full ranges of oxygen ingress rates (μL/day) through screw caps, "technical" and natural cork stoppers, and synthetic closures, during the first month and the subsequent months of storage.**

| Closure Type | Storage<br>First month | <br>Horizontal | <br>Vertical |
|---|---|---|---|
| Screw caps (tin liner) | <500[a] | 0.2–0.7 | — |
| "Technical" corks | 15–40 | 0.1–0.4 | 0.1–0.9 |
| Natural corks | 25–45 | 1.7–6.1[b]<br>0.1–2.3[c] | 0.5–4.4[b]<br>0.1–2.7[c] |
| Nomacorc synthetic closure | 30–40 | 6 | 8–9 |
| SupremeCorq synthetic closure | 35–45 | 11–15 | 11–12 |

[a] at moment of bottling
[b] from 2 to 12 months of storage
[c] from 12 to 36 months (horizontal) and 12 to 28 months (vertical) storage

This report provides results of the total oxygen ingress through different cylindrical and screw-cap closures into wine bottles after bottling up to 36 and 18 months of horizontal storage, respectively. The impact of bottle orientation over 28 months of storage was also assessed.

### *Results*

Figure I shows the kinetics of oxygen ingress through different

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closures into wine bottles stored horizontally and vertically over 36 and 28 months, respectively. It can be observed that only the control (bottle sealed by flame) was completely airtight, while other closures were permeable to oxygen. Oxygen pickup through cylindrical closures was much more important in the first month than in the following months of storage. This latter period was extremely dependent on the oxygen barrier properties of each closure. Probably, the important increase in color change during first month is likely to be due to oxygen within closures that diffuses out of the closure during compression. The oxygen entrained at fill was negligible (less than 9μg/L, measured by polarographic probe).

"Technical" cork stoppers (Twin Top and Neutrocork) exhibited a low level of oxygen permeation (0.1 to 0.4 μL per day, Table I). In contrast, synthetic closures, Nomacorc and Supremecorq, exhibited the highest oxygen permeation, reaching a limit of quantification for our method (2.5 mL of oxygen) within 140 and 290 days, respectively (Figure IA).

Natural cork stoppers exhibited medium levels of oxygen permeation. On average, the best grade of natural cork stoppers ("flor") exhibited lower oxygen ingress than the intermediate one (first grade) (Figure IA). This latter grade presented some variability among four replicates, which can perform as well as the natural "flor" grade or similar to the less permeable Nomacorc synthetic closures.

The oxygen permeation patterns for natural corks differed from other closures. Generally, oxygen ingress through natural corks decreased over time, mainly between the second and twelfth month (1.7 to 6.1 μL per day), then rose gradually (0.1 to 2.3 μL per day) until completion of the study at 36 months (Table I). These data shows that natural corks' permeation varied by a factor of 3.5 between two and 12 months and 23 in the following months, which are substantially lower than the oxygen transmission rates and 1000-fold variation reported by other studies.[1,4]

The main reason for this difference is the methodology used to measure oxygen permeation of natural corks (moisture-sensitive). Our method measures oxygen ingress through natural corks inserted in commercial glass bottles filled with an aqueous indigo carmine solution, while the Mocon method, used by other researchers, is based on measurement of oxygen transmission rates through corks inserted in a cut bottleneck without liquid contact.

The contact with liquid is an important factor in oxygen transmission through corks irrespective of

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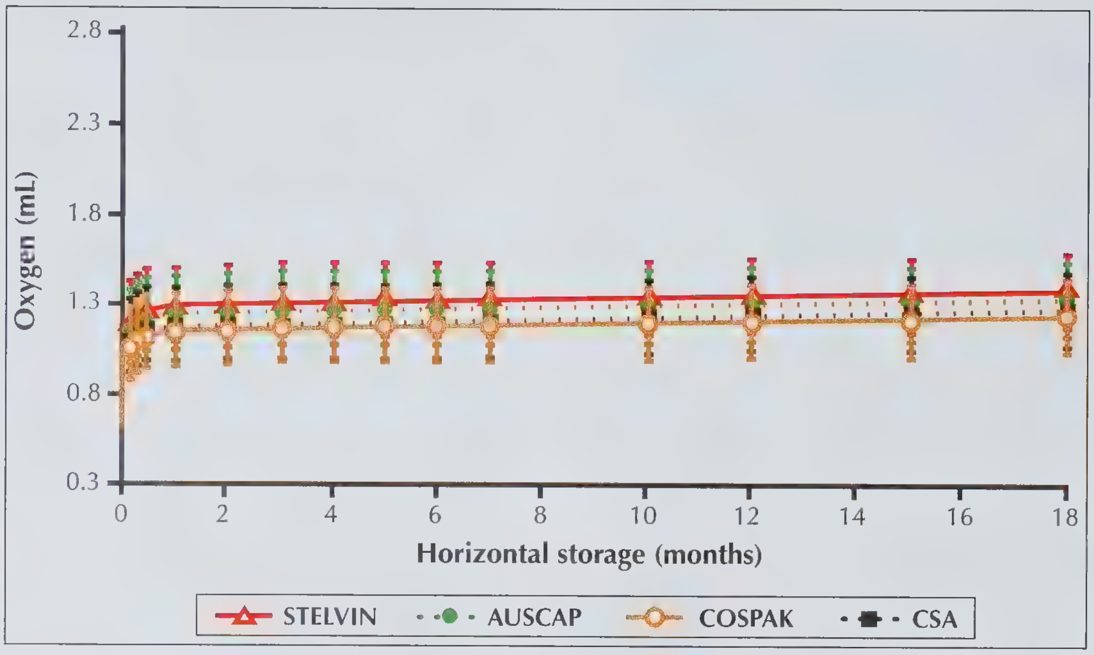
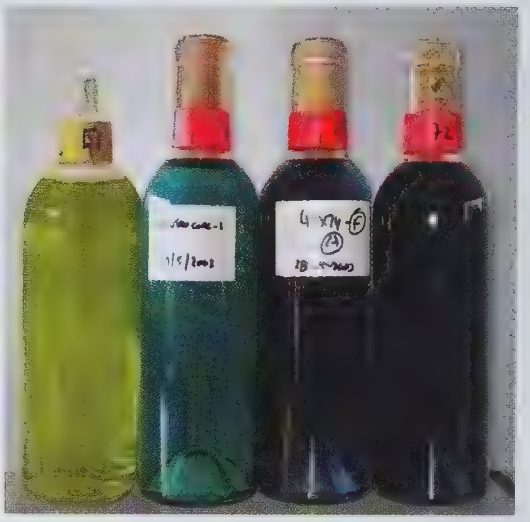


**Figure II. Kinetics of oxygen ingress through screw cap closures into wine bottles stored horizontally during 18 months. Error bars represent the standard deviation of four replicates.**



**Bottle #1 [left] (control) contains indigo carmine solution after 36 months of horizontal storage. Bottle #2 contains indigo carmine solution sealed with "technical" Netrocork® cork stopper after 36 months of horizontal storage. Bottle #3 contains indigo carmine solution sealed with natural cork stopper after 36 months of horizontal storage. Bottle #4 [right] contains indigo carmine solution sealed with Nomacorc Classic® synthetic closure after 10 months of horizontal storage.**

bottle orientation. Even in upright storage, the relative humidity inside a bottle is maintained at 100%, which allows the absorption of consider-

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able amounts of moisture by the corks.

Oxygen diffusion through screw-cap closures differed from cylindrical closures. The apparent entry of oxygen into wine bottles was substantially higher during bottling than in the following 18 months of storage. This appeared to be due to the insertion of oxygen contained within the screw-cap in bottle headspace at the time of sealing. After bottling, screw-caps allowed the ingress of consistent low amounts of oxygen (0.2 to 0.6 μL per day, Table I) with no significant differences between manufacturers.

The different oxygen barrier properties of each type of closure tested explain the large divergence in composition and sensory properties of wines sealed with different closures reported by several recent studies.[5,6,7] These studies showed that oxygen ingress rates exhibited by synthetic closures, result in wines with a high level of browning and high-oxidized aroma scores.

On the other hand, too low oxygen ingress rates, as shown by screw-cap closures and glass ampoules, promotes the development of rubbery or struck flint sulfide-like aroma characters (post-bottling reduction). Generally, cork stoppers presented intermediate performance.[6,7]

Another finding was that bottle storage orientation (upright or lying

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down) had little impact on oxygen ingress through most of the closures into wine bottles, at least over the first 28 months of the experiment under controlled conditions of temperature and humidity (Figure IB, Table I). These results agree with those recently reported by G. K. Skouroumounis *et al.* showing that no storage effect on the composition and sensory properties of white wines over five years, when the storage conditions are constant and controlled.[7]

### *Conclusion*

Different closures and sealing systems tested in this study resulted in a large divergence of oxygen barrier properties. After 18, 28, and 36 months of storage, only the control bottle (bottle sealed by flame) was air-tight. Other closures displayed different levels of oxygen permeation: low in screw-caps and "technical" corks, intermediate in conventional natural cork stoppers, and high in synthetic closures.

Judging by our findings and other recent research, it is clear that ageing of wine in bottle occurs under micro-oxygenation. However, the current issue is how much oxygen transmission is required from a closure for wines to age correctly in bottle, without oxidation or reduction problems. This will depend on grape varieties, winemaking practices, bottling procedure, closure performance, and storage conditions.

The bottom line is that only a better understanding of the wine chemistry and the sources of oxygen will enable us to determine the optimal amount of oxygen needed for wine to develop properly in the bottle. ■

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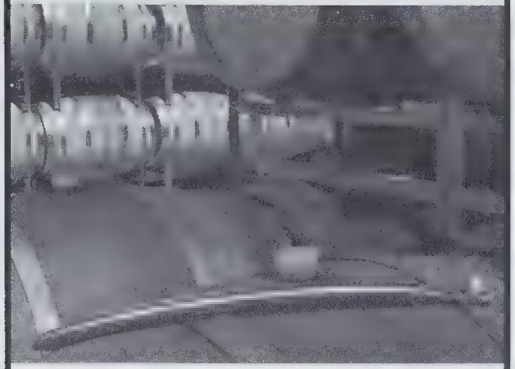

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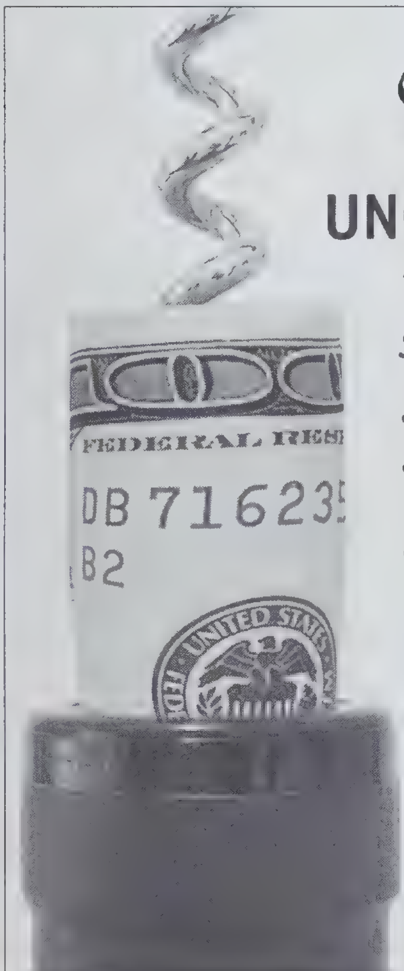

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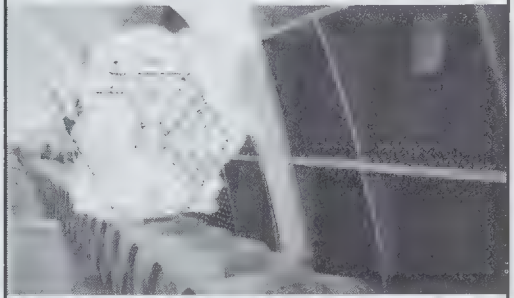

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# Trellising to manage canopy for improved wine quality

**BY Bryan Rahn, CP Ag-SS**

Trellis systems, ideally, provide an environment in which grape quality is optimized. In California viticulture, trellis design has changed a lot over the years. "California Sprawl" was the prevalent trellis system 20 years ago. This training system shaded the fruit well; often, it shaded too well for premium wine grapes. It also required wider tractor row spacing and provided an environment that was susceptible to disease development.

Enter the Vertical Shoot Position (VSP) training system. This system provides a trellis that holds the shoots vertically, allowing for better air movement through the canopy and more light into the fruit zone. The VSP system helps reduce disease pressure through better air flow in the fruit zone, and allows for equipment access in more tightly spaced vineyards.

More light, better color and flavors, therefore improved wines? Correct — up to a point. Problems arise when the trellis design allows the fruit to become too hot through overexposure to the sun. Light is okay — excessive heat is the problem.

While some versions of the VSP trellis system are a great fit for cool regions (not too hot), they can be problematic if not properly used in warmer growing regions.

There are many versions of VSP training systems in use today, but I will focus on only two. How the trellis system is designed affects fruit temperature — and ultimate wine quality.

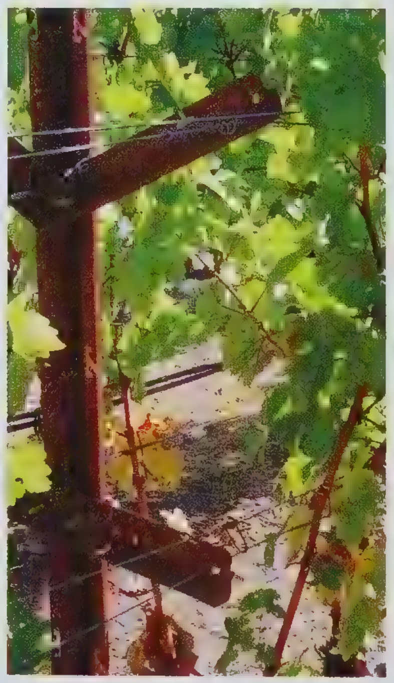
The first system is essentially a narrow metal post with notches to hold foliage wires. Variations of this system are primarily in the design of the stake. Other variations include T-posts with very short crossarms or clips to hold foliage wires. All of these trellis systems have potential overexposure problems. This system will be called the "Narrow VSP."

The Narrow VSP system is widely used throughout California's major winegrowing regions. It is a successful system in cool areas. However, its popularity has led to overexposed fruit and excessive fruit temperatures in many warmer areas.

If you observe dehydrated, lighter colored fruit on the sun side of bunches and normal-appearing fruit on the shade side of the same bunch, then there are problems with excessive exposure of fruit in your vineyard. Fruit temperature is very important to wine quality.

V-trellis

Top view of V-trellis with rake wires pulling foliage out to sides.



Version of V-trellis with cross arms and rake wires to pull foliage aside.

Example of narrow VSP

**Cane pruned VSP trellis — dappled light in fruit zone.**

In the warmer wine growing regions of California (including the red variety regions of Napa Valley and other premium winegrowing areas), some viticulturists began employing the Narrow VSP trellis along with aggressive leaf removal and the incorrect use of deficit irrigation (I'll leave the latter for another article).

The key is more balanced or moderate fruit exposure. As it often is in life, moderation seems to be the key to success. To help mitigate the problems associated with overexposed fruit, we have employed minimal leaf removal (or no leaf removal), and have left short shoots hanging over the fruit on the "sun side" (the "Mini California Sprawl"?) or only removed lateral shoots, etc. While these efforts help reduce excessive fruit temperature problems, it is the Narrow VSP system that needs to change.

A partial remedy for excessive fruit temperature problems resulting from the Narrow VSP system is to change row direction. Using the Narrow VSP system in a north/south row orientation has been problematic in warmer winegrowing areas, as shown by fruit temperature measurements. Such measurements have shown exposed fruit on the west side of north/south oriented rows to have the highest absolute fruit temperatures and reduced anthocyanin concentrations.[1]

Another study has shown exposed fruit on the south side of east/west oriented rows to have higher fruit temperatures, lower anthocyanin concentrations, and lower total phenolics than fruit on the north side of the row.[2]

In Napa Valley vineyards with the Narrow VSP trellis, I have observed more dehydration and overexposed fruit problems on the west side of north/south rows than the south side of east/west rows. It should be noted that vine row spacing (shading from adjacent rows) could also impact sun exposure to the fruit.

Fruit temperature studies have led to a recommended row direction of 45 degrees east of true north (a 45 degree directional heading) to provide the best balance of light and fruit temperatures in warmer areas. Therefore we can use row direction to reduce (although we cannot always eliminate) the effects of excessive fruit temperature by shading the fruit

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In this edition, we want to let you know about a few of our current winegrowers who are following in the steps of their ancestors. They are taking advantage of modern technology but respect old-fashioned sustainable farming techniques that encourage biodiversity and leave the earth, and Mendocino County, healthier for our future generations.

**Mendocino County is a transitional area.**
The most significant factor influencing our grape quality is that we are situated between the Pacific Northwest and the Mediterranean climate of California. Because of the mountain (almost 60% of the County is covered with coniferous forests) and valley terrain, micro-climates are highly variable. Anderson Valley is the coolest wine growing area. Potter Valley, Yorkville Highlands and Redwood Valley are intermediate in warmth. Hopland, Sanel Valley and the Ukiah Valley are the warmest regions.

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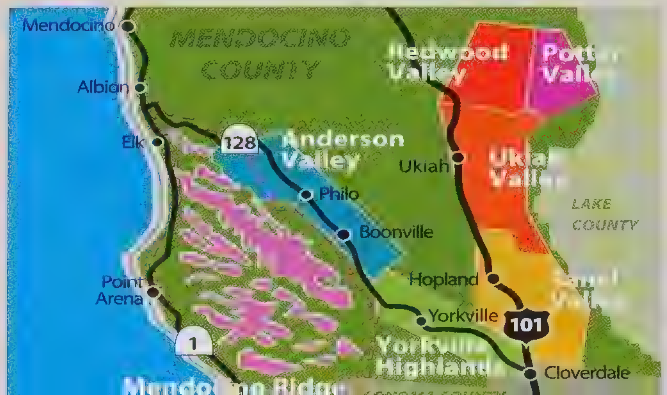
### Top Mendocino Varietals

| Whites | Acres* |
|---|---|
| Chardonnay | 4,336 |
| Sauvignon Blanc | 786 |
| Gewürztraminer | 218 |
| Viognier | 121 |
| Pinot Gris | 116 |
| Chenin Blanc | 101 |
| French Colombard | 85 |
| White Riesling | 68 |
| **Reds** | |
| Cabernet Sauvignon | 2,559 |
| Zinfandel | 2,072 |
| Pinot Noir | 1,930 |
| Merlot | 1,853 |
| Syrah | 715 |
| Petite Sirah | 537 |
| Carignane | 423 |
| Sangiovese | 115 |
| Barbera | 70 |
| Grenache | 65 |
| Cabernet Franc | 60 |

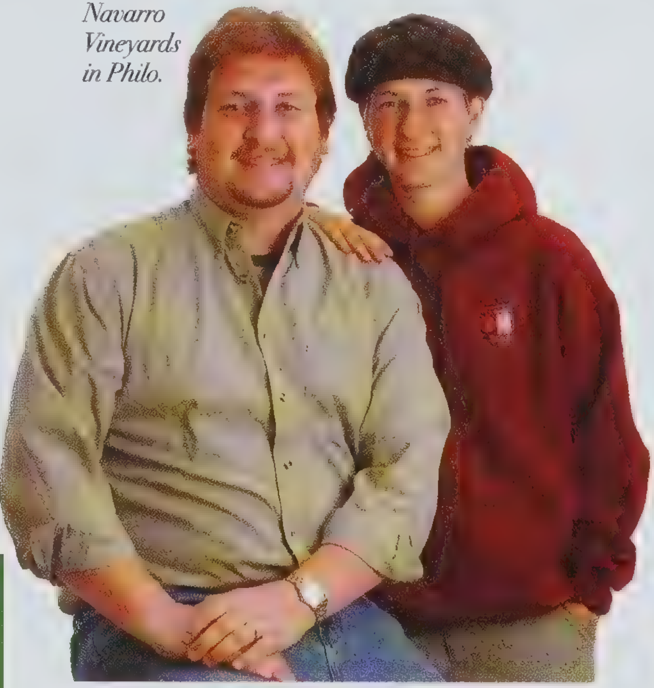
*Varietals with over 50 acres planted.

### MAIN APPELLATIONS & GROWING REGIONS
(Others: McDowell Valley, Cole Ranch, Covelo and Dos Rios)



## "New-old" farmers – making a difference in Anderson Valley

**by Aaron and Sarah Cahn Bennett**
*Children of Ted & Deborah, founders of Navarro Vineyards in Philo.*



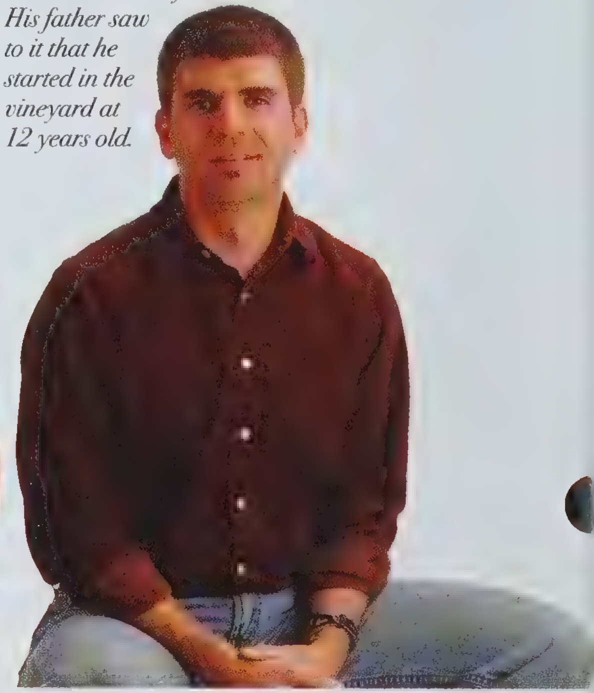
Navarro Vineyards is family-owned and each member of our family contributes uniquely to the farm. Our parents started planting grapes in the Anderson Valley in 1974, and we sampled our first non-alcoholic Gewürztraminer and Pinot Noir Juice as toddlers...palate training started early.

**In 2006, Sarah received her Masters degree in Viticulture and Enology from UC Davis.**
Her research was on the phenolics of Pinot Noir from Mendocino, providing hard data on what makes Mendocino's award winning Pinot Noirs so special. After a winemaking stint in New Zealand, she is back home contributing with initiatives like introducing sheep and a portable chicken house into Navarro's vineyards as a fossil-fuel-free method of mowing, suckering and limiting pests.

**Aaron designed Navarro Vineyard's first website in 1996.**
After working the dot-com boom in Southern California, Aaron is back home sharing his talents and overseeing our online presence. Navarro may be a two and one-half hour drive from the Silicon Valley, but Aaron's internet savvy and photography helps us spread the word about the fine grapes and world-class wines being produced in Mendocino County.

## Farming organic and biodynamic certified in the Ukiah Valley

**by Heath Dolan**
*Dark Horse Vineyards*
*His father saw to it that he started in the vineyard at 12 years old.*



I'm a fifth generation winemaker/grape grower in Northern California, and I'm the second generation in our family farming in Mendocino County. I was fortunate to attend Fresno State University where I obtained degrees in enology and viticulture. That education has allowed me to be able to work in both the winery side of the business as well as growing grapes. My brother, Jason, my father and I are the owners of Dark Horse Vineyards, which is farmed 100% organic and biodynamic certified. I am also the owner of a wine storage facility called Premium Wine Storage.

**Mendocino County is my home.**
Now that I look back, there was never any question in my mind that I would return to Mendocino County to work in the wine industry. In college, I worked as a viticultural research tech in almost every AVA in California. Working for Fetzer Vineyards allowed me to tour and work in many wine regions around the world. Every time I returned home, I was reminded that our vineyards here are as beautiful and well suited for growing grapes as any other place on earth. Now that I have been in the industry for a number of years, I have realized we already produce very high quality wine grapes and have unlimited potential to excel. Mendocino County has been overlooked for many years as a producer of high quality grapes, but as new generations incorporate new technologies, the quality is well on its way to achieving its full potential.

# generation winegrowers reveal why they their livelihoods on Mendocino grapes.

## Farming by rows - not by blocks in Redwood Valley

**by Ric Piffero**
*Piffero Home Ranch*
*Third generation farming 160 acres; wouldn't consider farming anywhere else.*

Among our total acreage, 25 acres are on the Piffero Home Ranch, which was established in 1930 by my grandparents Victorio and Rose Piffero. It is this old vine Zinfandel that goes into the vineyard designate Edmeades Piffero Vineyard Zinfandel. This year, that wine won a double gold at the San Francisco Chronicle Wine Competition, and it scored a 92 in the Wine Spectator.

**We younger farmers are growing grapes differently than our forefathers did.**

In June or the first part of July, they would apply their last sulfur application and would not enter the vineyard again until harvest. Now, we are farming to meet the quality standards that the winemakers, and ultimately the consumer, are looking for. They want flavor and complexity. So to achieve this end, we farm our vineyards by rows, not by blocks. We're looking at the direction of how the row is planted in relation to the sun's path, the water table, soil changes, and we adjust the sunlight on the grapes by pulling leaves. We are conscious of the importance of working closely with the winemaker, and we treat it as a partnership with the goal in mind of producing a premium bottle of wine. I believe the emerging success of Mendocino County is in its growers as we have the largest number of owner/operators versus "investor-types" or "farming companies" compared to other counties.

© Mendocino Winegrape and Wine Commission, 2007.

## Great grandparents cleared their land in 1912 with dynamite

**by Maria Testa Martinson**
*Gusto Vineyards*
*Fourth generation and very proud of it!*

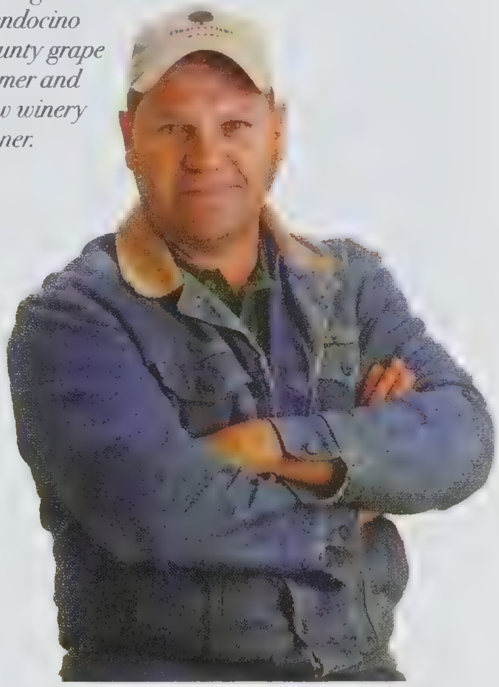
The dream my great grandfather, Gaetano, had to own his own vineyard started when he was a young boy working the switchboard on the train in Northern Italy and would look out at the beautiful vineyards. That is why he got off the train here in Mendocino County in 1912. It reminded him of his homeland. He and his wife, Maria, worked to clear the land, using dynamite and horses. Some of the original Carignane vines are still harvested to this day.

**My elders would be proud because I am carrying on the heritage we have all worked so hard for.**

They would love the new hillside Cabernet Sauvignon vineyard my husband, Rusty, and I have now. They would be pleased to see the pride we take in our certified organic vineyards. Taking the best care of our grapes comes through in the wines made from them. I'm sure my Papa would be proud of me when I made my first barrel of wine also - right there in his basement.

## Coming home to the Redwood Valley for the fine quality

**By Greg Lolonis**
*Third generation Mendocino County grape farmer and new winery owner.*



In 1914 my grandparents, Tryfon and Eugenia Lolonis, arrived from Vlaherna, Greece, and immediately began clearing the land to plant grapes. When my father passed on two years ago, I was left with the responsibility of farming our land. I had gone away to Sacramento State and Davis...

**But I knew I wanted to be a part of the winegrape growing community in Mendocino County.**

The draw of returning was knowing that Mendocino produces some of the best quality for many of the varietals that were planted on our 90 acres by my predecessors. Recently we started the Oracle Oaks label. Because I'm proud to grow in Mendocino County, I used "Mendocino" on the label. I've re-planted the old, virused Valdegue vines (and many other varietals) with better rootstocks and clones, and now I'm able to grow grapes that make our wine distinctive with expressive flavors of our area.

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for a period of time from the afternoon sun.

What if site topography will not allow the desired row direction? If you are farming a hillside, it makes sense from soil management (avoid excessively disturbing soils) and equipment safety standpoints to farm up and down the slope.

What if the shape of the field makes a row direction of 45 degrees east of true north unfeasible? If managing shade and sun on the fruit is the answer to the problem, then we could use trellising as part of the solution. Modifying the Narrow VSP trellis system to better manage fruit temperatures is the answer.

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A second, wider VSP system is the "VSP V-trellis." There are several versions of this system in practice today, but I will describe only one. The VSP V-trellis is not a series of small same-size crossarms on a stake or T-post. It is not the very wide V-trellis used in table grapes or a simple T-trellis that allows foliage to flop over a crossarm into the tractor row to shade fruit.

The VSP V-trellis employs a series of cross-arms beginning 12 inches above the fruiting wire (on a stake or T-post) that increase in width from bottom to top (forming a V). The fruiting wire is typically 34 to 36 inches above ground (on a stake or T-post) in this system.

The tightest vine row spacing with this exact trellis that I have observed (so far) is six feet. The width of the crossarms depends, in part, on row direction and width. Vineyards with more optimal row directions (compass heading 45 degrees from true north) can employ shorter crossarms.

Vineyards with less than optimal row direction will need longer crossarms to provide sufficient shading on the sun side. If you intend to retrofit an existing Narrow VSP system, then I suggest placing crossarms in the trellis during mid-summer to determine the required crossarm length. The width and spacing of the crossarms should be just wide enough to provide the correct amount of light and fruit shading.

A preferred VSP V-trellis would have three crossarms spaced about 12 inches apart vertically above the fruiting wire. The first (lower) crossarm (about 12 inches above the fruiting wire) is 12 to 16 inches wide, the second (middle) crossarm is 16 to 20 inches wide, and the third (upper) crossarm is 20 to 24 inches wide. I have seen upper crossarms as wide as 36 inches used in some VSP V-trellised vineyards.

I have also observed successful VSP V-trellis systems with only two crossarms above the fruiting wire. There are several possible variations of this system that will accomplish the desired effects.

A VSP V-trellis can provide the right amount of light and shade to the fruit zone. It also provides more space for the fruit to hang without contacting

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other clusters, thus allowing light — and air — to contact all sides of the cluster. In contrast, the Narrow VSP pushes the shoots and fruit together, reducing both light contact to some clusters and air movement around the clusters.

In a VSP V-trellis system, the upper two crossarms must be notched for rake wires in order to hold the shoots in a vertical position and open up the center of the trellis. Otherwise shoots may fall (or get blown by wind) in a more horizontal direction, and grow along the vine row. The rake wires pull the shoots to the sides of the V, keeping them in a vertical position.

In the VSP V-trellis system, the shoots are not held directly above the fruiting wire; instead they angle away from the cordon toward the tractor row. This allows filtered light down the center of the "V" section of the trellis. The rake wires are employed after the shoots are combed into vertical, laterally separated positions down the fruiting wire. The shoots can then be trimmed — but only if required. Ideally, well-balanced vineyards do not require shoot trimming.

Allowing the shoots to grow just past the end of the top trellis wire on the sun side of the vines can also provide additional shading if needed.

This system has proven to be one of the best methods so far for managing excessive fruit temperature in California's warmer wine growing regions, including Napa Valley and warmer areas of Sonoma County.

The VSP V-trellis system is in use in Napa Valley, Sonoma County, and Livermore Valley in Cabernet Sauvignon, Merlot, and Zinfandel vineyards thinned to yields of three to six tons per acre.

Vineyards using this exact trellis system were established seven years ago (and more since then) with excellent results. Other Cabernet Sauvignon vines were retrofitted over four years ago with similar success. I am sure there are other variations of this system that have enjoyed similar success and more vineyards will follow. ■

*[Bryan Rahn, Coastal Viticultural Consultants, is a certified professional soil scientist and consulting viticulturist. He has been consulting in the wine industry for 25 years.]*

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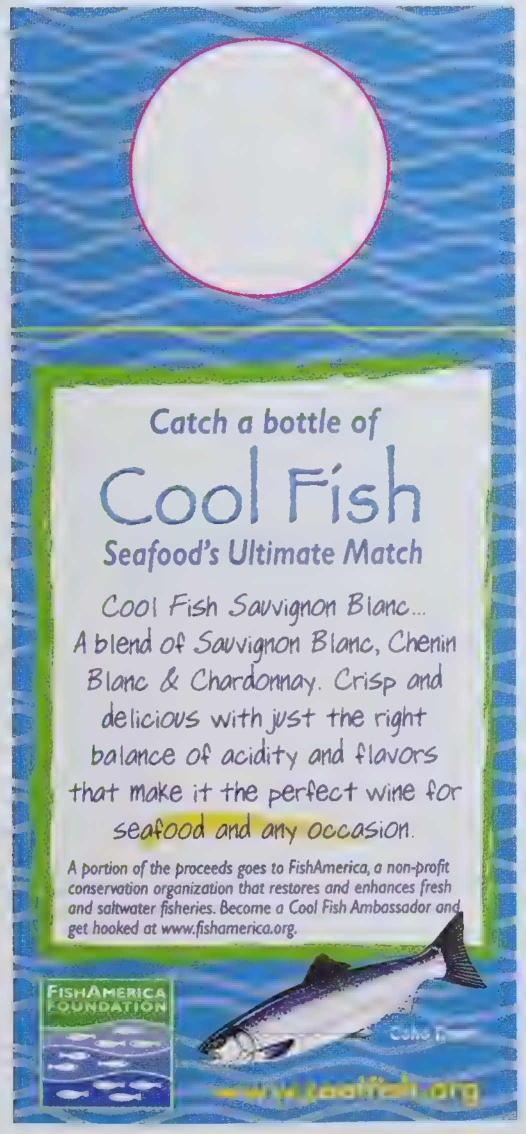
# Brand identity with "Aquarium" labels

**BY Dean Brightman**

"Serious wine in a fun package" is how Stonehedge Winery president Shahin Shahabi describes his Cool Fish brand, which began with the 2002 vintage. The clear, pressure-sensitive front-and-back label features many fish around a bright "Cool Fish" logo. Cool Fish wines, under Dennis Patton's blending, were all crafted specifically to pair with seafood.



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A portion of the proceeds goes to FishAmerica, a non-profit conservation organization that restores and enhances fresh and saltwater fisheries. Become a Cool Fish Ambassador and get hooked at www.fishamerica.org.

### Cool Fish brand identity

Although these wines may seem to be emulating the current marketing trend of "critter" wine packaging, there is a very big difference, according to Shahabi.

"These are not 'me-too' wines," he says, referring to "cartoonish" labels such as Yellow Tail. Every bottle has actual scientific illustrations of specific fish species, each clearly labeled by its proper name.

Transparent labels were specifically designed to look like aquariums, with the fish seeming to "swim" through each bottle.

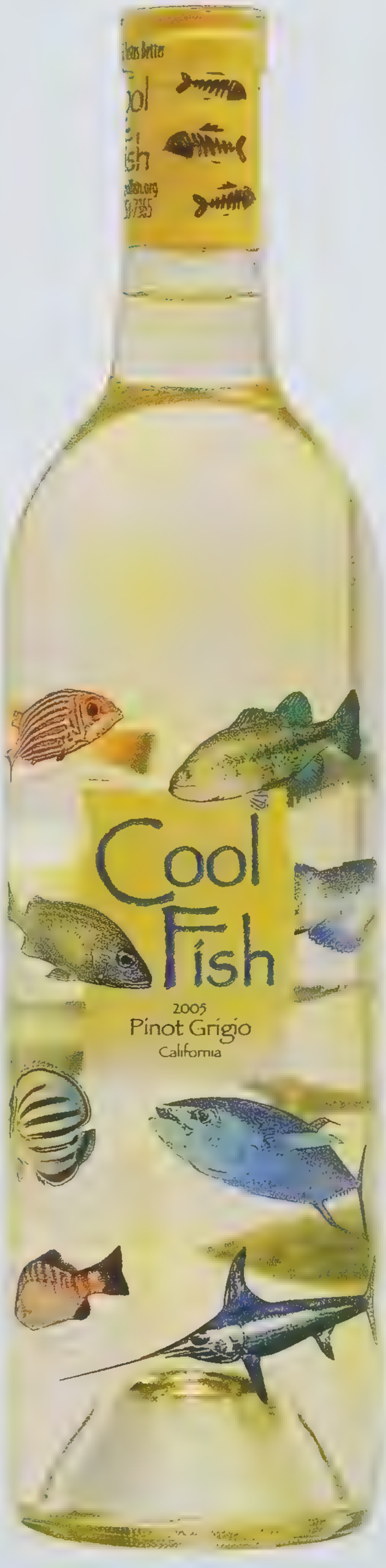
Five wines are available — Pinot Grigio, Sauvignon Blanc, Chardonnay, a dry rosé and a red blend. The winery produced 50,000 cases in 2006 at a custom crush facility in Santa Maria, CA on the central coast.

### Winemaking style and food pairing

Dennis Patton's winemaking philosophy for this brand is to stay away from heavier, bigger wines by making blends focusing on lighter body, bright, fresh fruit, and crisp acidity, with no malolactic fermentation and no oak. The bottled wines are under 14% alcohol, less than 0.4 residual sugar with 0.6 to 0.75 total acidity, and under 3.6 pH.

Patton considers Cool Fish a fun project that allows him a lot of flexibility. "We can stay close to style while using multiple grape varieties." By buying large lots on the bulk market (Sauvignon Blanc, for example), then blending these "base" wines with different percentages and varieties of other, smaller lots, Patton can create a Cool Fish wine style and still offer a selection of flavors.

In an unusual step, Shahabi enlisted the input of chef Tom Finch, when developing the first vintage of Cool Fish wines, to establish a wine style which would pair well with fish. Finch, who currently owns and operates Fillipe's Pizza Grotto in Napa, CA, is a veteran of the hotel industry. During 16



years as executive chef and beverage director for Marriott in Napa, he met Shahabi, who was selling wine there.

Shahabi approached Finch about his project and wanted his opinion on how well the wines would pair with seafood. The two got together over a batch of Finch's cioppino, tried some wines, and Finch declared them a success.

Finch says he appreciates the Cool Fish wines because "they aren't high-end wines, but more of a fun table wine."

Although the primary goal of each wine is to pair with seafood, Shahabi will not stick to a consistent flavor profile with each vintage. Instead, he will let what's available on the grape market dictate what goes into the final wines.

The 2006 Cool Fish red is a blend of Merlot from the Sierra Foothills, Carginane from Mendocino, and Pinot Noir from the Santa Cruz Mountains. Although he would like more Pinot Noir in the blend, the current demand for Pinot Noir grapes in the market would push the wine above the target price point (about $10 per bottle).

In the future, Shahabi would like to give his red blend a varietal name (Merlot/Grenache, for example) that he hopes would be more appealing and familiar to those who may otherwise be somewhat reluctant to drink a red wine with smoked salmon.

### Marketing

Shahabi's marketing plan is first to push brand recognition through restaurant sales. The retail price point would make it an ideal candidate for by-the-glass programs. He also has placed Cool Fish in Trader Joe's. Wal-Mart agreed to test-market the Chardonnay and Pinot Grigio in selected markets in Florida in 2006. The Wal-Mart test was a success, placements expanded from 32 stores to 91 in 2007, and to stores in nearby Georgia and Lousiana.

The model seems to be working. Annual case sales increased from 12,000 cases sold in 2003, to more than 50,000 cases in 2006.

Response to the new brand has been positive, says Shahabi, but people are still reluctant to reach for the red blend to have with dinner.

### Packaging

Sales increased so swiftly, in fact, that labels for the red blend had to be changed to accommodate the increased production. The original red bottles featured ACL ceramic-fired decoration. In 2005, Cool Fish switched to pressure-sensitive (PS) labels on all bottles to reduce packaging costs and speed up production.

"Each wine has a different mix of fish depicted on the label," says Shahabi. "Some fish are on labels because they pair best with that varietal, and many of the fish are just for the customer's visual education about fish."

Producing the 4¼-inch wide X almost six-inch tall labels presented challenges, according to Doug Sage at TAPP Technologies. The fish were getting lost on the transparent backgrounds and not showing up well against the wine. The problem was solved by switching from water-based to UV-based inks for improved color saturation (or "pop," according to Sage), and by laying an opaque-white layer underneath the four-color fish to give them more definition.

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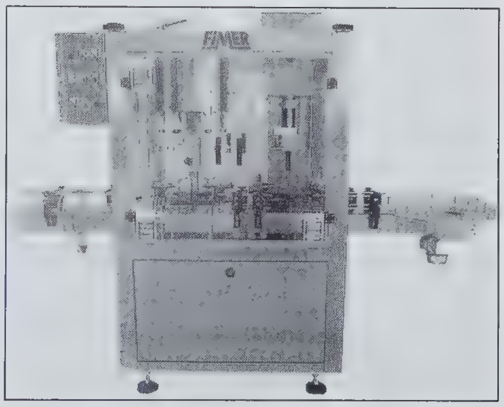

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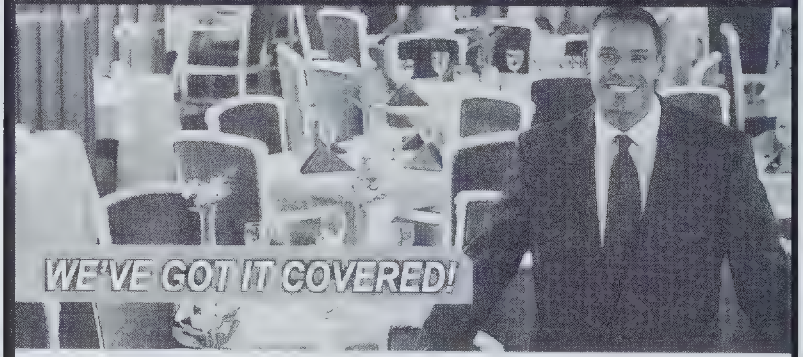
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"Black grouper never looked so good," says Sage.

Other challenges inherent in transparent PS labels included adding a layer of laminate to help "stiffen" the labels to aid in peeling them from the backing on the bottling line. Also, the sensors on the label affixers had to be "fine-tuned" to detect the label edges.

According to Sage, the biggest advantage in using PS labels versus ceramic decoration is cost. Bottling speed is roughly the same using ACL-decorated bottles, but the bottles themselves are more costly since the decoration must be done at the glass manufacturer first.

The lower cost of PS labels also gives winemakers more flexibility. "It is not always known far in advance of bottling what volume of each grape varietal or blend is to be bottled," says Sage. "On a PS film label, the winery can order with enough buffer to cover this variability."

"The labels have to be carefully handled on the bottling line," reports Chris Brown of Central Coast Wine Services (Santa Maria, CA) where the wine is bottled. "The flint glass from Encore was well-chosen to make the labels look great, but the label is a challenge. If we don't apply them just right, they can look rippled and bubbled, like a bad car window glass-tint job. There is only a ⅜-inch gap between the front and back labels."

Brown worked with TAPP Technologies to ensure the label stock was thick enough not to ripple while maintaining the desired look.

The bottles are purged with nitrogen to clean them out and push out oxygen, then filled, and sealed with a corker (pulling a vacuum on insertion of the SupremeCorq). The dissolved oxygen is maintained at 1.1 to 1.2 ppm, and the $O_2$ in the headspace is less than 5% with this method.

"The GAI bottling line can normally handle 80 bottles per minute at top speed," notes Brown, "but we operate at about 55/minute for Cool Fish. We added an extra wiper, a foam-rubber sponge we created to make absolutely sure the labels press on cleanly."

The final quality control measure for Brown and his bottling team is when they hand-pack bottles into cases. The case packers handle each bottle and reject bottles with bubbled or rippled labels,(about 2 to 2.5%), which have to be re-labeled. Brown is working hard to reduce that percentage.

Closures for Cool Fish are made in various bright colors to match the playful bottle packaging, by SupremeCorq (Kent, WA), and the latest bottling features SupremeCorq's new X2 closures. "Shahin chose the X2 because it looks

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and feels more like tree bark cork," says Joyce Steers-Greget of SupremeCorq. "It is available in any color so the corq can continue to be used to enhance the Cool Fish packaging."

Cool Fish uses blue SupremeCorqs for Chardonnay, green for Sauvignon blanc, yellow for Pinot Grigio, pink for dry rosé, and red for the Cool Fish Red blend.

The concept of specifically crafting wine to pair with seafood interested the FishAmerica Foundation, a non-profit organization supporting America's fisheries and fish habitats. A portion of the proceeds from the sale of Cool Fish wines will be used to fund wetland restoration projects. In 2007, Shahabi presented a $15,000 donation to FishAmerica.

In early 2007, Cool Fish opened a new tasting room and visitor's center at 1004 Clinton Street in downtown Napa. Shahabi opened in the slow winter season with just two employees and some "soft grand openings," while working with the Napa Chamber of Commerce to put his tasting room into local maps and guides. The tasting room sells Stonehedge, the winery's flagship brand, and highlights Cool Fish as a lighter, fun-sibling brand.

"The tasting room may not be a large volume of our annual sales, but as a part of our overall marketing plan, the goal is to give a physical presence to brands which don't have a home winery building, to increase exposure for Stonehedge and Cool Fish, and to establish them both with the vast numbers of winery tourists who visit Napa Valley each year."

Shahabi planned summer events for the tourist season, and to increase the tasting room staff to accommodate expected traffic. With an increase in Wal-Mart sales locations and other retail venues, he expects this fun, hip brand to continue growing. ■

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# JetBlue Airways matches fun foods, quality wines for coach passengers

**BY Millie Howie**

“When you hear about airline passengers enjoying wine during a flight, the reference is usually to those who fly in first class or business class. You rarely hear about wine being served in coach,” says Eric Brinker, director of brand management and customer experience for JetBlue Airways.

“When there is a reference to wine in coach, it is usually the least expensive, mass-produced wine an airline can buy. We looked at the situation and said, ‘Let’s take a different approach. There has to be a way to build a budget for inexpensive quality wines for coach passengers.’”

Brinker knew JetBlue needed a partner with more wine knowledge than he had to help locate wines that were a good everyday value. That was when he called on Josh Wesson, co-founder and wine director of Best Cellars, Inc. (New York, NY).

Wesson, a leading authority on the pairing of wine and food, was challenged not only to select high-quality, low-cost wines for the program, but additionally to recommend those brands, varieties, and vintages that pair well with the seven complimentary snack items offered on each flight: Terra Blue Potato Chips, the official snack of JetBlue Airways made from naturally blue potatoes; Wheat Thins Chips; Roasted and Salted Cashew Halves; Cheese Fix Munchies; Jungle Crackers; Chocobilly’s Chocolate Chunk Cookies, and Almond Pistachio Biscotti. All seven are low fat and prepared with no trans-fats.

Wesson and his staff function as the primary screeners of wines from wineries motivated to place their products in this unique distribution partnership. “We will usually sample 150 or more wines,” he explains, “to get to the final 30 to 40 wine selections for the JetBlue panel of marketing and in-flight members to review. The wines come from all over the world and are chosen because of their high quality and because we see them as ‘fun’ brands.

“We are fanatically devoted to providing JetBlue customers with a memorable in-flight wine experience. To a point, we’re constrained by cost, but we never let those constraints get in the way of deliciousness or of the value proposition of the wines we offer onboard.”

Though the labels on some of the wines might be described as “quirky,” Wesson does not feel that unusual label art plays a part in the wine evaluation. “While we like the wines on board to look as good as they taste,” he explains, “the quality of the juice inside the bottle is far more critical to our decision-making than any novelty factor in a name or a label.”

The wine choices are all bottled and served in 187ml bottles and sold at the standard industry price of $5 per bottle. “In our opinion,” states Brinker, “the wine we serve on JetBlue is considerably better than that served on many other airlines.

With its enticing array of pink grapefruit and papaya jam flavors, 3 blind moose Chardonnay is one white wine as elegant as it is engaging.

Airline seat cards show JetBlue passengers their choice of wines.

Since we are only allowed to board two wines, it is important that we pay special attention to quality and appropriateness of the wines we serve."

The program began in November 2005 with Twin Fine 2004 California Pinot Noir and Chardonnay. These choices were followed in June 2006 by two French wines: Just Languedoc Merlot and Sauvignon Blanc. The current pair, Three Blind Moose California Merlot and Sauvignon Blanc will be featured until mid-summer 2007.

Brinker believes JetBlue may be the first airline to serve Pinot Noir in coach. "It was just by chance that we were showing the film *Sideways* as the in-flight movie at the time," he recalls with a grin.

"There is no 'hard sell' for the wine program. Passengers are introduced to the wines through pictures and descriptions displayed on the map channel on every seat-back television screen."

When you taste as many wines as Wesson does, you sometimes find some unexpected matches. "Every time you sit down to pair wine with food, you learn something new. For example," he explains, "I was genuinely surprised by how well the deep-fried Cheetos — a savory component of the Doritos Snack mix — smoothed out the Just Merlot.

"There were even a few generalities we noted as the program moved ahead. Fruity, mouthwatering, not-too-oaky wines — regardless of color, grape type, or provenance — seem to work well with a wide range of snacks."

Education is on-going, and Wesson makes regular trips to JetBlue University in Orlando, FL, to teach new flight attendants all about the wines that have been selected for the program. The classes last about one hour and include such topics as tasting, serving, and wine-and-food pairing. Comparative tastings of wines offered by other carriers in their coach class are also part of the training sessions.

Both Brinker and Wesson consider feedback from JetBlue passengers an invaluable part of the program. "It's very rewarding," comments Brinker, "to have our customers tell us, without any prompting, how much they enjoy the opportunity to learn more about wine and how superior they find our choices when compared to wines served on other planes."

Wesson concludes, "It's been very satisfying to play a part in upgrading the quality of JetBlue's wine selections to what I — and, most important, what JetBlue's customers — believe are best-in-class levels of deliciousness. To see fellow passengers enjoying the wines I've helped select makes my day every time I fly." ■

---

**The following closures appear in photo on the following page, counter-clockwise from top left:**
**Cakebread Cellars, natural cork (Amorim Cork America);**
**Estancia, twin-top cork (Portocork America);**
**Baywood Cellars, tin capsule (Ramondin USA);**
**Glass closure by Alcoa (Encore Glass);**
**Edna Valley Vineyard, twin-top cork (Portocork America);**
**Rocking Horse, tin capsule (Rivercap);**
**Corbett Canyon, screw-cap (Alcan Packaging);**
**Hess Collection, synthetic closure (Nomacorc);**
**Incognito, synthetic closure (SupremeCorq);**
**Cool Fish, synthetic closure (SupremeCorq);**
**South Coast Winery, tin capsule (Sparflex);**
**Red Newt Cellars, synthetic closure (Nomacorc);**
**Langtry Estate & Vineyards, DIAM cork (Oeneo Closures);**
**Gloria Ferrer, tin capsule (Sparflex).**

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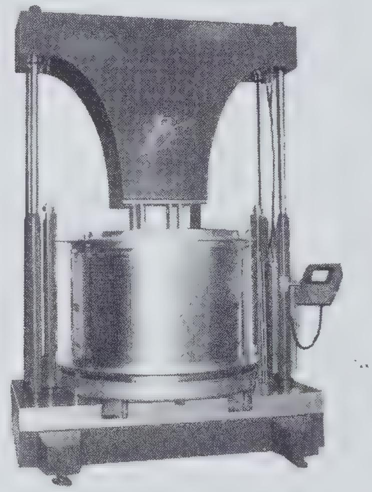

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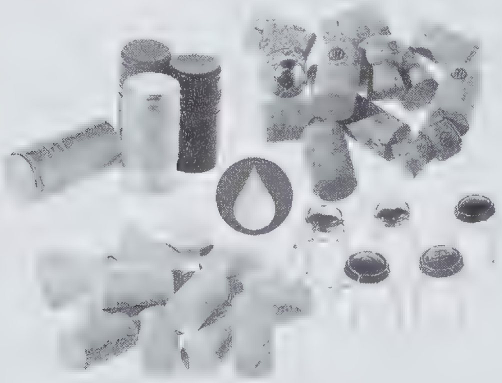

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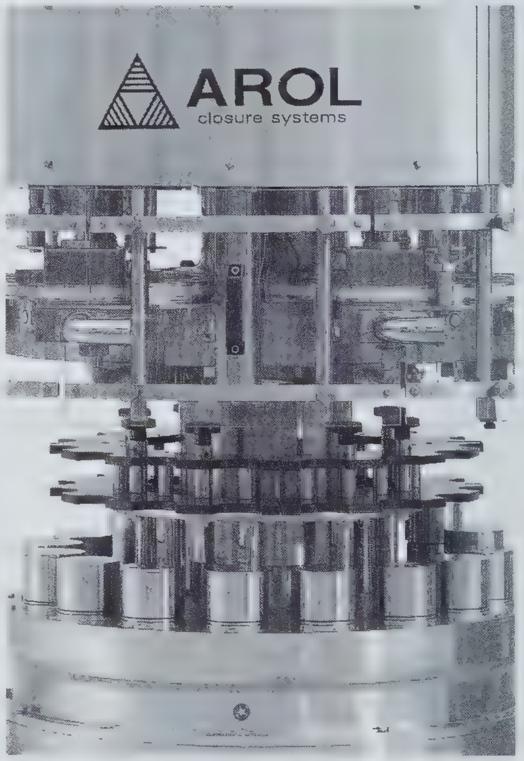

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***PLEASE SEE G3 ENTERPRISES AD, PAGE 69.***

## Encore!

ENCORE! has been supplying and serving wineries since 1975 and has grown to fulfill the glass and packaging needs of over 800 wineries in the western United States. ENCORE! has attained this growth by meeting/exceeding customer expectations by providing individual attention they deserve.

ENCORE! distributes more than 70 wine moulds in nine different colors with various finishes that range in sizes from 187ml to 27L. ENCORE! also imports a wide selection of European styles for special products and provides mobile decanting and repacking.

ENCORE!

With over 30 years of experience, ENCORE! is a leading innovator in wine packaging to suit all needs whether they be bottles, ceramic decorating, litho cartons, specialty bottles, or just regular bottling needs.

Encore! is the exclusive provider of VinoSeal, a pioneering glass closure solution, in the Western U.S. Encore! is very interested in what wineries want.

ENCORE! supplies molded wine shippers in two- and three-pack formats with matching cartons that meet Wine Institute/CAWG purchasing guidelines for sustainable packaging. Two-pack trays are available in two-, four-, six-, and 12-pack shippers. Three-pack trays are available in three, six-, and 12-pack shippers.

*For more information, contact:*
**ENCORE!**
4345 Industrial Way, Benicia, CA 94510
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e-mail: dave.hammond@encoreglass.com
website: www.encoreglass.com

***PLEASE SEE ENCORE! AD, PAGE 57.***

## ColloPack Solutions, LLC

ColloPack Solutions is a leading provider of integrated bottling lines and grape processing systems. ColloPack offers a comprehensive line of bottling equipment from single machine replacements to complete lines, including:

- The Bertolaso Cleaner / Filler / Corker/Capper Bloc;
- Robino & Galandrino capsuling equipment;
- Cavagnino & Gatti pressure-sensitive and wet-glue labelers;
- Francesca pumps;
- Bertolaso automated conveying systems;
- Perrier & Champagel sparkling wine bottling machinery.

COLLOPACK
SOLUTIONS LLC

ColloPack also provides engineering, project management, installation of equipment, conveyors, and electrical, and after-sales service and parts programs customized to each winery's needs.

*For more information, contact:*
**ColloPack Solutions, LLC**
**Dave Means, Phil Giacalone, Rick White, Joe Mironicki, Mike Wlodarczyk, Craig Richardson** or **Greg Fulford**
193 Camino Dorado, Napa, CA 94558
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e-mail: sales@collopack.com
website: www.collopack.com

***PLEASE SEE COLLOPACK SOLUTIONS AD, PAGE 3.***

## SAVERGLASS INC.

Saverglass Inc. has carved out a position as a world leader in luxury bottles for spirits and fine wines. In addition to offering a wide selection of in-stock-available products, Saverglass specializes in custom bottle manufacture and decoration. Saverglass is the first choice for makers and marketers of ultra-premium wines, who understand the necessity of distinctive packaging for brand recognition and shelf positioning.

Saverglass has two production plants in France (Feuquieres and Le Havre), which produce 200,000 tons of glass per year. Recent expansions and acquisitions have increased the integrated decoration capabilities, which include nine ceramic printing lines, 2-color–coating lines, two organic printing lines, and an acid-etching plant. Saverglass offers all necessary options for customization and decoration with the highest possible quality, innovation, and service.

SAVERGLASS

Call for a showroom appointment and review the latest Portfolio and Creative Glass Journal, highlighting top Saverglass products created in the past 12 months. Saverglass is both ISO 14001 and 9001-certified and meets the most rigorous standards of quality in the industry.

*For more information, contact:*
**Saverglass Inc.**
**Daniel Repoux**, President and CEO
**Sylvie Langlois**, Sales Account Manager
**Aurora Noel**, Sales Account Manager
**Jyll Castagnia**, Sales Account Manager
**Carol Tracy**, Sales Administrative Manager
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website: www.saverglass.com

*PLEASE SEE SAVERGLASS AD, PAGE 28.*

## ALCAN PACKAGING CAPSULES OF CALIFORNIA

Alcan Packaging Capsules of California is committed to serving wineries with top quality capsules (tin, polylam, sparkling), and STELVIN® screw caps.

Since 1985, Alcan Packaging Capsules of California, located south of Napa, has been producing tin, polylam and sparkling capsules, and is the only supplier in the U.S. market to produce these capsules at a Napa Valley plant. The Alcan team is devoted to providing the best service.

First in the wine market with the revolutionary STELVIN® screw cap, Alcan Packaging Capsules introduces another innovation, the STELVIN® LUX, answering an ongoing need to enhance packaging. An insert has been specifically designed for this closure which shows no threads after sealing, providing a large printing surface for the most elaborate designs (top embossing, side printing).

Alcan is committed to excellence in Environment, Health and Safety. Alcan's goal is to protect and promote all communities where the company operates. The American Canyon, CA plant is certified ISO 14001 and OSHAS 18001.

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**Alcan Packaging Capsules of California**
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web: www.stelvin.alcan.com

*PLEASE SEE ALCAN AD, PAGE 25.*

## ACI CORK USA

**Science and Art — Grown To Perfection** describes ACI Cork USA.

The company has found a powerful balance of technology and tradition to provide the American wine market with the finest natural and technical cork closures available. It uses both time-honored methods and rigorous scientific testing to reach its goal of producing a cork stopper of impeccable quality.

The Dras-Red processing system uses dry steam to produce remarkable results against TCA.

ACI CORK USA

ACI is a founding member of the Portuguese Cork Quality Institute and has received the Certified Company Trophy for compliance with the ISO 9002 Quality Assurance System. ACI is compliant with the rigorous HACCP standards, originally drafted for NASA.

NEW PRODUCT: **Aglica Micro-Granular Corks**, an attractive environmentally friendly alternative to synthetic closures. Samples and technical specifications are available.

ACI's facilities are newly equipped and technologically sophisticated. The new ACI Cork USA has a 30,000 square foot state-of-the-art processing plant in Fairfield, CA. ACI welcomes customer visits to any of its facilities.

*For more information, contact:*
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website: www.acicorkusa.com

*PLEASE SEE ACI CORK USA AD, PAGE 6.*

## RAMONDIN USA, INC.

As a leading worldwide supplier of quality tin capsules, Ramondin has the latest innovative products and production capabilities to make packaging truly world-class. Ramondin has been making capsules for the wine industry since 1890. Ramondin was the first tin capsule manufacturer to receive ISO 9001 certification, complying with strict standards of quality, safety, and service, and the ISO 14000 certificate, which has special emphasis on protecting the environment.

Customized modifications to Ramondin's printing machines have created a proprietary production process, which allows printing of virtually anything imaginable.

Ramondin has implemented a reuse/recycling program. Recyclability is one of tin's great merits. Ramondin's recycling program encourages wineries to return plastic trays for reuse in new tin capsule orders. Tin is an excellent replacement for environmentally undesirable metals and plastics. Ramondin buys the purest tin and processes the metal into the perfect closure. Ramondin's continued commitment to protecting the environment has led to development of water-based paints — no more solvents.

When designing new packaging, Ramondin can advise which capsule is best with a given label. If only bottling small wine batches, ask about Ramondin's new stock capsules.

*For more information, contact:*

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2557 Napa Valley Corporate Dr., Ste. G
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e-mail: ramondinusa@ramondinusa.com

*PLEASE SEE RAMONDIN USA, INC. AD, PAGE 9.*

## COGITO CREATIVE WORKS

Cogito Creative Works offers professional marketing and creative services for U.S.-based products and services. As a small company with a network of high talent/low attitude creative professionals, Cogito delivers effective marketing programs to satisfied, long-term clients. With extensive, top-notch experience in brand management, advertising, packaging, identity design, consumer research, marketing, and new product development, the Cogito team is knowledgeable about what resonates with customers; imaginative about how to reach them; thoughtful in understanding the client's business; and focused on results.

COGITO
CREATIVE WORKS

Unlike expensive, big, impersonal agencies, or one-man-show graphic design studios that are not really equipped to develop and manage a brand, Cogito offers big-league experience — sound business counsel and innovative, persuasive creativity — without big agency bureaucracy or fees. Cogito assesses the client's consumer-touchpoints — marketing efforts, identity, packaging, etc — in the context of the client's business and its competition. Then Cogito develops an actionable plan, and implements it with creative materials that persuade people and increase customers.

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website: www.cogitocreative.com

## CORK SUPPLY USA, INC.

Cork Supply USA has been redefining quality expectations for over 25 years, pushing for groundbreaking innovations, enhanced research, greater testing, and an unmatched level of support and service.

CORK
SUPPLY
USA

In addition to pioneering vertical integration and independent quality sampling in the natural cork industry, Cork Supply created INNOCORK, a patented process that delivers ultra clean, virtually perfect natural corks. Vapex Technical corks are available in both 1+1 and Micro-Agglo styles.

Responding to the needs of the industry, Cork Supply bucked the trend a decade ago by complementing natural cork with carefuly-sourced alternative closures. As top-of-the-bottle specialists, Cork Supply offers the number-one selling synthetic cork (Nomacorc), screwcaps made to exacting specifications (SAVin), and the versatile Rivercap tin and polylam capsules. This family of products is further enhanced by the new VinOak division, offering French and American oak barrels and alternatives to maximize your oak investment.

Cork Supply invests in service by supporting every product line with specialized expertise and a veteran sales and support team.

*For more information, contact:*

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website: www.corksupplyusa.com

*PLEASE SEE CORK SUPPLY USA AD, PAGE 2.*

## ABB LABELS

ABB Labels is a one-stop manufacturer that consistently provides total customer satifaction. ABB Labels believes that ordering labels should be as easy as applying one. Starting with an idea, simple sketch, or a complex graphics file, ABB Labels takes care of all details through final printing and production.

The company offers a broad range of products and services to ensure meeting and exceeding customer expectations. The ABB graphics team accepts artwork in virtually any format; most simple updates are provided at no additional cost; color proofs are available upon request; and within hours after approval of art, the color-separated films and plates are produced, and the job is scheduled for production. A wide variety of label types including custom labels, food packaging, and beverage bottle labels (up to eight colors) are available.

New for 2007, ABB Labels is introducing a new digital indigo press for superior quality and quick turnaround for orders of as few as 1,000.

ABB Labels goes the extra mile for its customers with quick turnaround times, competitive pricing, full in-house graphics, and much, much more.

*For more information, contact:*
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**Pedram Fararooy**
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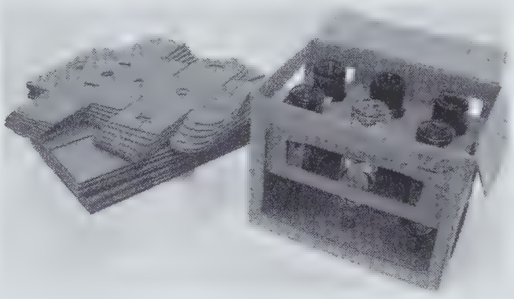
tel: 213/748-7480, toll free: 888 Call ABB;
fax: 213/748-5838
e-mail: Sales@ABBlabels.com
website: www.ABBLabels.com

*PLEASE SEE ABB LABELS AD, PAGE 10.*

## STANDARD PACKAGING CORP.

Standard Packaging Corp., a distributor of packaging materials since 1985, introduced the space-saving, environmentally friendly, and price-effective BottleKraft™ Wine Shipper in 2005. The BottleKraft™ Wine Shipper features a lay-flat/fold-up insert design that saves warehouse and truck space, minimizing storage and freight costs. The BottleKraft™ Wine Shipper is made from strong, recyclable corrugated fiberboard and has passed UPS®, FedEx®, and ISTA® package testing. The wine shippers are available in one, two, three, four, five, six, and 12-packs.



The BottleKraft™ Wine Tote is a product created after an extensive study of how a conventional wine tote could be improved, and features a space-saving design, partition windows that display the wine bottles, and reinforced construction, all at a low price.

More than 15,000 sets of BottleKraft™ products have been sold since its introduction, and Standard Packaging Corp. continues to make improvements and new products to best serve the needs of its customers.

*For more information, contact:*
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website: www.standardpackaging.com

## CRYOTECH INTERNATIONAL, INC.

Cryotech International, a leader in liquid nitrogen delivery systems for oxygen displacement, helps wineries reduce headspace oxygen and extend shelf-life in screwcap-packages while maintaining taste.

As wineries transition to screwcaps, winemakers are presented with new, unique challenges. Although screwcaps eliminate the concern of "cork-taint," screwcap bottles have a greater volume of headspace. Wine is exposed to oxygen trapped in the bottle headspace which, in turn, can result in increased dissolved oxygen levels, even after the cap is applied. Cryotech can help.

By introducing liquid nitrogen into the bottle after filling, winemakers reduce headspace $O_2$ content by more than 70%. Less headspace $O_2$ results in a significant reduction of dissolved $O_2$ pickup.

Cryotech has a complete line of liquid nitrogen-dosing equipment to automate and control the introduction of $LN_2$. A very small dose of $LN_2$ is injected into the filled bottle. One part of liquid nitrogen warms and turns into 700 parts of gas, displacing $O_2$ from the headspace.

After installing a Cryotech injection system, one winery reports dissolved oxygen content of less than 0.03 ppm without compromising the fresh fruit taste of the wine.

*For more information, contact:*
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website: www.cryotechinternational.com

*PLEASE SEE CRYOTECH AD, PAGE 38.*

## SCHOLLE PACKAGING

Scholle Packaging provides a range of high quality bag, fitment, and filling technologies and is proud to introduce Form-Seal-Fill (FSF) technology to the U.S. wine market. FSF technology provides wineries with higher throughput, to raise the performance of bag-in-box packaging.

Scholle®
PACKAGING

Developed by Flextainer, a division of Scholle Packaging, FSF for bag-in-box dramatically changes how bags are produced and supplied, by enabling wineries to manufacture and fill bags on-site. FSF equipment will produce and fill bags in one continuous operation (from 1-liter to 10-liters). The machine is available in both single or duo-lane configuration, each with a 6-head rotary filler.

Additionally, because FSF makes bags on-site from rolls of film and bins of pre-assembled spouts and taps, freight cost and the storage space required to warehouse the packaging materials are dramatically reduced compared to pre-made bags. Customers will find that their working capital cost is reduced, as they are better able to manage their own supply chain. The economies of FSF will enable customers to utilize premium films and fitments, achieving best-in-class performance, at competitive prices.

While the FSF technology is an ideal solution for some customers, many wineries will still require traditional pre-made bags. With this new technology, Scholle can provide wineries with the best performance for their high- or low-volume needs.

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*PLEASE SEE SCHOLLE PACKAGING AD, PAGE 33.*

## BERGIN GLASS IMPRESSIONS

Bergin Glass (BGI) has provided premier glass decorative services to the wine industry since 1989. BGI built its reputation on creating high-end artisan work, beginning with etched and hand-painted wine bottles. The staff has been with the company for over ten years, constantly building on their capabilities. This decorating option has been almost exclusively reserved for large format sizes — 1.5L to 27L.

In 1996, BGI added decorative services of direct screen-printing and decal applications. Wine labels are produced on one-color, two-color, and six-color machines. Direct-screen printing has been growing in popularity as the wine industry becomes more knowledgeable on the merits and benefits of this type of packaging. Direct-screen printing allows designers and wineries to be bolder and more creative in their label design, by allowing more use of the overall bottle surface — front and back.

BERGIN
GLASS IMPRESSIONS

Production managers and winemakers welcome screen-printed bottles, because they do not create disruptions on the bottling line. Labels can never be scuffed, applied crooked, wrinkle, or appear to bubble and fog (think pressure-sensitive).

In February, 2006, BGI moved into 24,000 sq. ft of new production space, with a commitment to serve the wine industry another 18 years. BGI will continue to develop unique and exciting wine label packaging that reflects the passion and personality of owners and winemakers alike.

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**Bergin Glass Impressions, Inc.**
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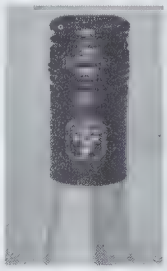
website: www.berginglass.com

*PLEASE SEE BERGIN GLASS AD, PAGE 26.*

## A.O. WILSON LTD.

Now in the 62nd year of serving the alcohol beverage industry, A.O. Wilson offers newly created aluminum ropp closures specifically for the wine industry. It is the *ClassWin* and *ClassCap* for *BVS*-thread finishes. The *ClassWin* is the standard roll-on design for the BVS-thread finish, the *ClassCap* simply threads on the bottle, and the applicating head tucks under the skirt below the glass-thread finish.



*ClassWin* caps (30x60mm) are available in several plain colors with the saran and tin liner most suitable for the wine industry. Printed caps are available upon request.

Please allow A.O. Wilson to discuss your future screw cap plans. You may inquire for your capsule, foil, cap, bidule, cork, or wirehood requirements.

*For more information, contact:*
**A.O. Wilson Ltd.**
PO Box 820, Bolton, Ontario
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website: www.aowilson.ca

*PLEASE SEE A.O. WILSON AD, PAGE 110.*

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## M.A. SILVA CORKS

The M.A. Silva Corks new facility provides the level of customer service and quality customers expect of their natural closures. New building highlights include:

- AiroCide™ technology used in the humidity room to destroy airborne bacteria;
- Independent laboratory-reviewed specification sheets of all materials used in the building;
- Exterior insulation and food-grade caulked flooring;
- Increased inventory storage capacity;
- Large laboratory with a separate room for customers to conduct sensory evaluations safely and undisturbed.

M.A. Silva Corks continues to subject corks to a multi-level process of sampling, testing, acceptance, and rejection. Their partner in Portugal, M.A. Silva Cortiças, controls the newly harvested cork wood, from seasoning to processing.

The high-tech boiling system at M.A. Silva Cortiças is designed to dramatically reduce presence of contaminants, and enhance the neutrality and purity of all raw cork materials. Bark and punched corks are analyzed at various production stages for the presence of 2,4,6 Trichloroanisole (TCA) with a GC/MS testing machine.

Once in the U.S., M.A. Silva Corks conducts TCA-screening through an outside laboratory, exceeding the Cork Quality Council requirements. The company's primary goal is to constantly improve quality and give its customers confidence in using M.A. Silva natural corks.

*For more information, contact:*

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website: www.masilva.com

*PLEASE SEE M.A. SILVA CORKS AD, PAGE 105.*

## DELTA PACKAGING

The Original Earth Shipper (TOES) was re-launched in 2007, addressing the concern for wine transport safety and integrity while offering a completely "green" product. Founder Don Nelson and his team have developed and perfected new designs, tested by FedEx, providing a shipper with the required integrity, and zero impact on the environment.

An innovative, modular, "green" shipper using a non-GMO cornstarch medium called "Green Cell," TOES was selected by the 2007 Napa Valley Wine Auction as the shipper of choice, because of the environmental statement it makes. TOES can be composted, is recyclable, water soluble in landfill, and Earth-friendly.

Shippers are available in two-, three-, four-, and six-bottle sizes. A full-case shipper is under development. Breakage and scuffing tests have proved the Earth Shippers protect well against both potential wine shipment problems.

TOES is designed to replace petroleum-based packaging, that is virtually impossible to recycle/dispose of in a responsible way. Until more widely adopted, manufacturing cost of the Earth Shippers is more expensive than styrofoam or corrugated shippers; Delta Packaging seeks forward-thinking adopters in the increasingly sustainable wine industry, for its products.

Currently, TOES is available from several California dealers: SLO Wine Storage serves the Central Coast area; Heritage Paper & Packaging Plus serves Northern California.

*For more information, contact:*

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**Mike Meneghelli**, Napa Valley consultant
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e-mail: mmeneg@sbcglobal.net

## ZORK USA

The ZORK® wine closure provides consistent performance and delivers unsurpassed integrity to ensure that your wine develops as the winemaker intended.

The many benefits of the ZORK® closure are:

- Consistent and predictable oxygen transmission rate (OTR).
- ZORK will not leak, taint, or contaminate wine.
- ZORK is easy to apply and works with a variety of filling/capping equipment with minor modifications. Skilled technical service professionals help make changeover a snap.
- "The rigor applied to the independent evaluation of ZORK exceeds most commercial trials and parallels benchmark closure research," says Peter Leske, independent analyst and winemaker.
- ZORK is now manufactured in the U.S. to accommodate widely available glass finishes.
- In independent consumer acceptance research conducted by a major U.S. wine company, a majority of respondents ranked ZORK in the top three in preference of available wine closures, well ahead of cork and screw caps.
- Enhances the quality image of the brand and creates differentiation on the shelf.
- Delivers consumers the convenience of a screw cap and the celebration of a cork.

Brought to you by The Committee for the Next Generation in Wine Packaging.

*For more information, contact:*

**ZORK USA**
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website: www.zorkusa.com

## AMORIM CORK AMERICA

Amorim Cork America is the U.S. subsidiary of Amorim and Irmãos of Portugal, the world's largest manufacturer of natural cork closures. Amorim Cork America provides sales, service, and custom finishing services to wineries throughout the U.S.

AMORIM CORK AMERICA

Amorim utilizes a quality assurance process called ROSA. It is a proprietary steam-distillation system that dramatically reduces the level of TCA in cork. ROSA's results have been confirmed by independent trials from the world's leading research laboratories.

Amorim Cork America offers a full line of natural cork products:

**Natural straight cork** in standard 24mm diameter; 38mm, 45mm, 49mm, 51mm, and 54mm lengths available in two washes: BWC or Natural.

**Spark® cork,** designed for sparkling wine and utilizing INOS II-washed disks to eliminate off-aromas.

**Twin Top® cork**, a closure with an agglomerated mid-body with a ROSA-treated disk at each end, widely accepted for its consistency of size, performance, and sensory neutrality.

**Colmated cork**, a high-quality, low-cost alternative for wines meant for early consumption.

**Neutrocork®**, a micro-agglomerated closure made of ROSA-treated particles that make it price-competitive while maintaining excellent sensory values.

Amorim Cork America is a member of the Cork Quality Council. All corks are subject to GC/MS testing for TCA at ETS Laboratories prior to acceptance into inventory.

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PLEASE SEE AMORIM CORK AMERICA AD, PAGE 20.

## RIVERCAP USA

Backed by more than 30 years of experience, Rivercap USA has established itself as a world leader in the manufacture of premium wine capsules. Among its many firsts was the launch of its popular lightweight 80-micron capsule and the installation of an inside/outside super-cleaning capsule system that aids capsule performance.

Some of Rivercap's advantages that have secured its reputation as a world leading capsule producer, include a nine-stage deep-drawn shell for a flawless finish; compliance with CONEG heavy metal limits (<100 ppm); flexible product dimensions, and two-color registered side-prints.

RIVERCAPUSA

Their achievements were acknowledged in 2006 when Spain's Alava Chamber of Commerce recognized the Rivercap Group as one of its top 10 companies, showing an extraordinary 13% export growth rate over the previous year.

Rivercap USA, an independent division of Cork Supply USA, is the exclusive supplier of the Rivercap premium tin and polylam capsule lines for the North American wine industry.

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sales@rivercapusa.com
website: www.corksupplyusa.com

## SUPREMECORQ

Since 1992, Supreme Corq has offered quality-leading synthetic closures to the wine market, and is the only synthetic closure company in the world to achieve ISO 9001:2000, BRC (British Retail Consortium), and Organic Use quality certifications. All closures are recyclable and comply with FDA and EU regulations.

Supreme Corq offers the new SupremeCorq "X2" with more uniform cell structure, engineered to significantly reduce oxygen permeability, and enhance aesthetics of the closure. The "X2" has twice the oxygen barrier properties of the original SupremeCorq and other competitors, providing long-term sealing potential and neutrality.

SupremeCorqs offer a TCA-free seal to ensure wine consistency and are available in three sizes: 45mm, 38mm, and T-Top (pull closures). Available in any color, SupremeCorqs can enhance wine packaging and be printed with FDA-compliant color inks that do not rub off.

SupremeCorqs are injection-molded. The outer skin completely seals the closure — making it easy to remove and re-insert — protecting the internal cell structure, and preventing wine absorption.

Every SupremeCorq order is quality-tested for density (length, weight, and diameter), coating consistency, and insertion/extraction force, to ensure optimum product performance.

More than 1,600 wineries worldwide use SupremeCorqs to preserve their wines exactly as their winemakers intended.

*For more information, contact:*
**SupremeCorq, LLC**
5901 S 226th St., Kent, WA 98032
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website: www.supremecorq.com

PLEASE SEE SUPREMECORQ AD, PAGE 45.

*Hosted websites*
**continued from page 33**

website, and the ease of navigation. Another indicator of the website quality is that over 35% of visitors view the order page.

While the order completion rate is within industry averages of 20–30%, getting visitors to the order page is a key to converting a visitor into a customer. Wesley Steffens, the winery's manager, estimates that 150–250 completed orders come through the website each month.

As online sales grow, Vineyard 7&8 plans to integrate their online systems with other systems in place at the winery. From retrieving transactional data for compliance reporting, to maintaining a main repository of customer information and inventory levels, the technology will be leveraged to reduce winery staff efforts.

Steffens hired Cultivate Systems (Napa, CA) to build the online sales portal and infrastructure onto the hosted site. Customers can access immediate wine club sign-ups, mailing lists, and order fulfillment. The winery gets sales dollars delivered directly to its account, and valuable customer information in real-time.

Steffens plans to use the resulting client lists, histories and buying patterns to target customers' exact wishes when sending direct mail and e-mail promotions, wine release notices, and ordering information.

"The marketing, look and feel, and branding of a winery's website can be done by the winery itself, with its hosted services provider or website design team — we don't need to concern ourselves with that part of a site," says Eric Binau, CEO of Cultivate Systems.

"When the winery is ready to expand direct sales, we go in and install the infrastructure onto their marketing. The systems bring the customer seamlessly to the winery, make those sales bridges invisible to the customer, bring the income effortlessly into the winery accounts, and give the winery real-time and on-demand access to the data it needs to grow its online retail operation."

Currently about 75% sold through distributors, Vineyard 7&8 hopes the hosted website and its new business-to-customer direct links, can greatly increase direct sales. Steffens thinks the business can comfortably grow to between 2,000–4,000 cases with the current staffing and systems.

### Conclusion

The subscription-based model for websites is appropriate for the wine industry. The subscription or hosted website model should be included in any analysis of options for creating or enhancing a winery's website, as this model offers several advantages, including cost, over the buy or build models.■

*[Ron Kreutzer is President of WineWeb Enterprises, Inc., a company he founded in 1995 to provide an electronic marketplace for wine and Internet services to wineries and wine retailers. He can be reached at 505/577-9597, 888/236-0058, or ron@wineweb.com.]*

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*PLEASE SEE CALIBER WINEPAK AD, PAGE 53.*

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*PLEASE SEE JAMAK FABRICATION AD, PAGE 16.*

# Wine/grape research funding—2007

The American Vineyard Foundation increased funding from $887,633 in 2006 to $1,117,223 in 2007 to find solutions to problems facing the U.S. wine and grape industry. Viticulure Consortium West contributed $522,500, and California Competitive Grant Program for research in Viticulture & Enology contributed $350,000; a total of $1,989,723 for 56 grants.

### *Research funds granted include:*

Breeding, Germplasm, and Evaluation — 12 projects [$271,866]

Cultural Practices — 12 projects [$370,010]

Disease Management — 9 projects [$392,789]

Enology — 9 projects [$463,703]

Education — 6 projects [$210,984]

Pest Management — 8 projects [$280,371]

### *Research project, researcher, institution:*

ABA and color — Matthew Fidelibus University of California, Davis.

Accelerating the development of powdery mildew-resistant grapevines through marker-assisted selection — Lance Cadle-Davidson, USDA-ARS.

Amino acid levels and phenolic biosynthesis in skin and pulp of grape berries during ripening — Douglas Adams, UC Davis.

Analysis of sulfide off-odors produced during *sur lie* aging — Linda Bisson, UC Davis.

Application of near-infrared spectroscopy to commercial vineyards to map wine grape quality prior to harvest — Robert Wample, California State University, Fresno.

Biology / management of Argentine ants in California vineyards — Kent Daane, University of California, Berkeley.

Breeding rootstocks resistant to aggressive root-knot nematodes — Peter Cousins, USDA-ARS.

Characterization of ethyl phenols and other volatile components in *brettanomyces bruxellensis* off-flavor occurrence — Gavin Sacks, Cornell University-NY.

Characterization of the antimicrobial activity of grape pomace phenolic extracts — L. Bisson, UC Davis.

Clonal evaluation of the cultivars Syrah, Pinot Noir, and Chardonnay — Glenn McGourty, University of California Cooperative Extension.

Comprehensive guide to best practices for sustainable management of winery water, wastewater, and energy resources — Robert Chrobak, California Sustainable Winegrowing Alliance and WateReuse Foundation.

Determination of the role of fruit maturity in the sensory properties of Central Coast Cabernet Sauvignon wines — Hildegarde Heymann, UC Davis.

Development of a national registry for grape varieties and clones — Ed Stover, USDA-ARS.

Development of an enology outreach program — L. Bisson, UC Davis.

Development of improved raisin grapes for mechanical harvest including types resistant to powdery mildew — David Ramming, USDA-ARS.

Development of low density PCR array (IDPA) for detection of pathogens in grapevines — Adib Rowhani, UC Davis.

Development of seedless grapes for the fresh market, including types resistant to powdery mildew — D. Ramming, USDA-ARS.

Development of simple sequence repeat (SSR) markers for fingerprinting and genetic diversity assessment of phylloxera (*daktulosphaira vitifoliae*) in California — Hong Lin, USDA-ARS.

Effect of cluster temperature on the composition of berries grown under field conditions — James Kennedy, Oregon State University.

Effects of abiotic factors during various phenologic stages of berry growth and several cultural practices on methoxypyrazine levels in *vitis vinifera l.* berries — Larry Williams, UC Davis.

Etiology and detection of the cause of Syrah decline in Syrah grapevines — A. Rowhani, UC Davis.

Evaluation of Cabernet Sauvignon clones: Heritage, French, and old California sources — James Wolpert, UC Davis.

Evaluation of new winegrape varieties for San Joaquin Valley — J. Wolpert, UC Davis.

Evaluation of wine grape cultivars and clones for San Joaquin Valley — M. Fidelibus, UC Davis.

Evaluation of selected Mediterranean wine grape cultivars and international varietal clones — G. McGourty, UC Coop Extension.

Evaluation of in-row vineyard floor management practices on soil and water erosion, vine growth and productivity, weed control, and economics of wine grape production — Larry Bettiga, UC Coop Extension.

Grapevine canker diseases — Doug Gubler, UC Davis.

Grapevine cultivar and drying method effects on raisin yield and quality — M. Fidelibus, UC Davis.

Grapevine leafroll disease, general detail study and evaluation — A. Rowhani, UC Davis.

Grapevine powdery mildew control, revising the Gubler-Thomas model — Doug Gubler, UC Davis.

Greenhouse gas production and consumption by California vineyards: responding to the Global Climate Change Solutions Act (ab32) of 2006 — David Smart, UC Davis.

Growth and sugar transport in grape — Mark Matthews, UC Davis.

Identification of factors that influence the level of tannins and polymeric pigments in grapes and wines — D. Adams, UC Davis.

Improving yield and quality of Sauvignon Blanc — G. McGourty, UC Cooperative Extension.

Inception, diagnosis, and consequences of berry shrivel disorder — M. Matthews, UC Davis.

Influence of soil type and changes in soil solution chemistry during growing season, on vine growth parameters, and grape and wine quality — Jean-Jacques Lambert, UC Davis.

Integrating control of spider mites, leafhoppers, and powdery mildew with oil sprays in wine grapes (year 2) — Frank Zalom, UC Davis.

International research symposium on Syrah disorder and decline — Rhonda Smith, UC Coop Extension.

Investigations of a necrotic union disorder of Pinot Noir/110-R grapevines — Jerry Uyemoto, UC Davis.

Long-term and short-term controls for armillaria root disease — Kendra Baumgartner, USDA-ARS.

Mealybug transmission of grapevine leafroll-associated viruses — Rodrigo Almeida, UC Berkeley.

Molecular genetic support to optimize the breeding of fanleaf resistant rootstocks — M. Andrew Walker, UC Davis.

Oxidation of wine: control for quality — Andrew Waterhouse, UC Davis.

Pheromones for sampling major mealybug pests in California vineyards — Jocelyn Millar, University of California, Riverside.

Production and management of aroma compounds by *dekkera/brettanomyces* isolated from wine — L. Bisson, UC Davis.

Relationship between root system hydraulic conductance, canopy resistance to water flux and deep root foraging by grape rootstocks — D. Smart, UC Davis.

Search for, and development of, nematode resistance in grape rootstocks — Howard Ferris, UC Davis

Spatial variability of winegrape petiole nutrient content and relationship to vineyard soil properties: implications for nutrient management and identification of vineyard management zones — Stuart Pettygrove, UC Davis.

Spider mite control in vineyards (year 2) — F. Zalom, UC Davis.

Spider mites in California vineyards: temperature tolerance, effects of plant water status through leaf temperature, impact of novel pesticides and resistance management — Nicholas Mills, UC Berkeley.

Sustainable controls for vine mealybug: biological control and mating disruption — K. Daane, UC Berkeley.

UC viticulture outreach seminars — J. Wolpert, UC Davis.

Vegetative aroma: sensory definition, chemical interpretation (and ultimately) causal explanation — Susan Ebeler, UC Davis.

Viticultural practices and wine composition: a literature review — J. Wolpert, UC Davis.

Wine closure on volatile sulfur and aroma development during post-bottle aging — Michael Qian, Oregon State University.

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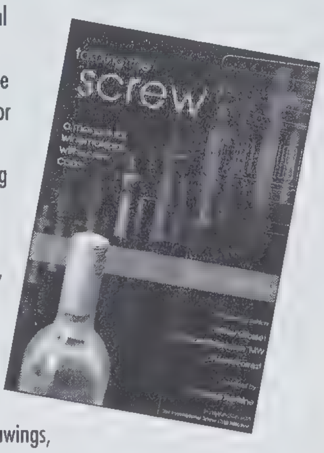

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GRAPEGROWING

# Irrigation is banned in France, isn't it?

**BY Dr. Peter Dry,**
**School of Agriculture, Food and Wine,**
**University of Adelaide, Australia**

Is irrigation of winegrape vineyards permitted in Europe? This is one of the first questions that I ask my viticulture students when we discuss European practices. Invariably they respond that it is banned in most cases.

I would be surprised if a survey of winegrape growers in North America did not come up with a similar response, or at least a qualified response — that it is permitted in some countries such as Germany, but certainly not in France.

The reality is that irrigation is permitted in many regions of Europe — and even in France at the present time, but under very strict controls. Despite the laws, irrigation of winegrapes in France is actually widely practiced, often illegally, particularly in the south — a case of *pas vu, pas pris* (not seen, not caught).

**Drip irrigation, Languedoc, France.**
**Photo by Peter Dry.**

I recall visiting a certain controlled appellation (AOC) region in the Languedoc on a bus trip associated with an international conference in 2001. As we drove through the region in early July, irrigation of winegrape vineyards by means of large sprinklers (quite illegal at that time of the year) was widespread. When I asked our French guide if the bus could stop so that I could add to my collection of "irrigation in French vineyards" photos, his response was to order the driver to go faster.

But the situation is changing, even in France.

What is the situation in other major wine-producing countries in Europe? In 1996, Spain authorized irrigation in all regions. In some regions the seasonal timing is restricted, in others it is not. As a result, yields have increased significantly in the latter regions. However, this increase cannot be solely attributed to irrigation, because there has also been substantial vineyard renewal.

Since 2001, irrigation has been permitted in Germany without restriction. Previously it was only allowed on steep slopes to provide compensation for the water used by the permanent grass cover essential for erosion control on those slopes. Growers are not likely to abuse this practice because its overuse will lead to high yields, which may not adequately ripen.

Analysis of the period 1951 to 2000 at Geisenheim (annual rainfall = 560mm) showed that irrigation would have been required in more than 80% of those years on vineyards with a typical southwesterly aspect and loamy sand soil if grass cover had been used, but in few of those years if grass cover had been absent (Jagoutz, 2005).

In Portugal, growers require permission from the local authority to install an irrigation system and this is usually forthcoming in all regions. In the Alentejo region in the hot and dry south, one can irrigate in years of "extreme" heat — which is conveniently not defined — so, in reality, irrigation amount and timing are not controlled.

In the higher rainfall Douro region in the north, irrigation can be practiced under an "experimental" regime, but again there seems to be little control. Implementation of irrigation has increased because much of Portugal has experienced drought conditions in recent years. For example, rainfall in the Alentejo was less than 270mm in the 18 months from March 2004, with only 70mm falling in the whole of 2005 up to harvest (Richardson, 2006).

Not surprising, the irrigation situation in Italy is extremely complicated and I will not even attempt to explain it in detail. Each controlled appellation (DOC, DOCG) has a particular set of regulations that pertain to the manner in which grapes are grown. But it is generally only those in Tuscany and further south that include any reference to irrigation at all (perhaps because it has been assumed that it will not be required in the wetter north).

In general, any irrigation that would increase yield in a "normal" season (known as "forcing irrigation") is prohibited; however, "rescue" irrigation is allowed in drought years (as in 2003). Timing of irrigation does not appear to be controlled.

There are some DOCs and DOCGs that, in the past, have prohibited any technique (including irrigation) that increases yield, but recently the rules have been modified to permit "rescue" irrigation, as in the Chianti Classico DOCG in 2005). For most IGTs *(Indicazione Geografica Tipica)*, irrigation is permitted. I have been informed that "rescue" irrigation is likely to be legalized everywhere in Italy in the future.

What is the current situation in France? Non-bearing vines may be irrigated without restriction — but most growers are not prepared to invest in an irrigation system that cannot be used (legally) in the long term. Since 1964, for bearing vineyards, one rule has applied to the whole of France: irrigation is not permitted from April 1 to Oct 31. In reality, this means that irrigation is only allowed before budburst — so growers may irrigate very heavily up to this date.

But there are exceptions, and certain AOCs have actually authorized irrigation after April 1 under strict controls. All are situated in the Midi or southern Rhône (Châteauneuf du Pape, Gigondas, Vacqueras, Côtes du Luberon, Corbières, Costières de Nimes, Minervois). According to at least one official French website, it has been estimated that at least 10% of the vineyard area of France benefits from irrigation in various forms.

It is interesting that many wine industry people in France are quite ignorant of the irrigation rules in their own country. For example, I was at a recent New Zealand conference and one speaker was a vineyard soils specialist from Burgundy. In his presentation, he made the interesting (and contentious) statement that irrigation is incompatible with the production of terroir wines. He has obviously chosen to conveniently ignore the reality of the situation in the vineyards some 100 km south of his region.

But the winds of change are blowing strongly in the wine industry of France. After several years of preliminary discussion, the organizations controlling the production of all wine (including AOC, *vins de pays*, and *vins de table*) have recently proposed major changes to the irrigation rules.

For example, for *vins de pays* and *vins de table*, irrigation will be allowed up to August 15; this effectively means that irrigation will be allowed for most of the growing season (harvest of Syrah in the southern Rhône starts from the end of August).

For AOC vineyards, irrigation will be deemed to be compatible with the "expression of terroir" in so far as it is an "exceptional corrective practice." (Note the emphasis on terroir here — rather ironic given the statement by the gentleman from Burgundy.)

Irrigation will be prohibited after May 1 (instead of April 1 as at present), and this extra month of irrigation will be introduced to compensate for low winter rainfall. In exceptional cases — presumably as for a dry season such as 2003 — the prohibition may be lifted between June 15 (about the time of flowering in the southern Rhône) and August 15. These proposed changes are revolutionary given the conservative nature of the French system, but my contacts expect them to be approved.

What has precipitated the proposed changes? The summer of 2003 was extremely hot with low rainfall. As a result, water stress was common in many regions. I was in Italy in September, and the symptoms of severe water stress were commonplace. Most vineyard managers in Tuscany to whom I spoke expressed the opinion that they would have irrigated had they been allowed to do so. In the event of likely climate change, it has been predicted that the need for irrigation will significantly increase in the future. ■

**Acknowledgements**: I am grateful to Elisa Masi, Manfred Stoll, and David Baverstock for information on irrigation rules in Italy, Germany, and Portugal respectively.

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*This article is based, in part, on "Irrigation regulations in France to be relaxed? Sacré bleu!" by Peter Dry, originally published in* Australian Viticulture *September/October 2006, and is reprinted here with kind permission of the publisher, Winetitles, www.winebiz.com.au http://www.winebiz.com.au.*

# Enough is enough

**BY Mike Dunne,**
**Sacramento Bee**

Darrell Corti is mad as hell and he isn't taking it anymore. Table wines with more than 14.5% alcohol, that is. He's vowing to no longer stock them at his family's 60-year-old Sacramento, CA grocery store, Corti Brothers.

California table wines with more than 14% alcohol, sometimes even exceeding 17%, have become not only increasingly popular but increasingly controversial, and Corti is sure to stir up the debate with his decision, quite possibly unprecedented in the world of wine.

Corti's breaking point came recently as he and his staff tasted through several wines they were considering adding to their inventory. Six of seven Zinfandels had more than 14.5% alcohol, with one hitting 17%. "This is stupid," says Corti. "And people say they don't buy Sherry because it has too much alcohol. Sherries, however, are fortified, and even then some won't have more than 15.5% alcohol."

Table wines are not fortified, and traditionally haven't exceeded 14% alcohol. In recent years, however, an increasing number of winemakers have subscribed to the notion that riper grapes yield more intense flavors in their wines. But with riper fruit comes more sugar, and with more sugar comes more alcohol.

Though some winemakers use methods to reduce alcohol content, others do not, with the result that the alcohol content of table wines has been trending up. Some longtime students of wine believe that the more alcohol a table wine has, the more likely it is to be off-balance and harsh.

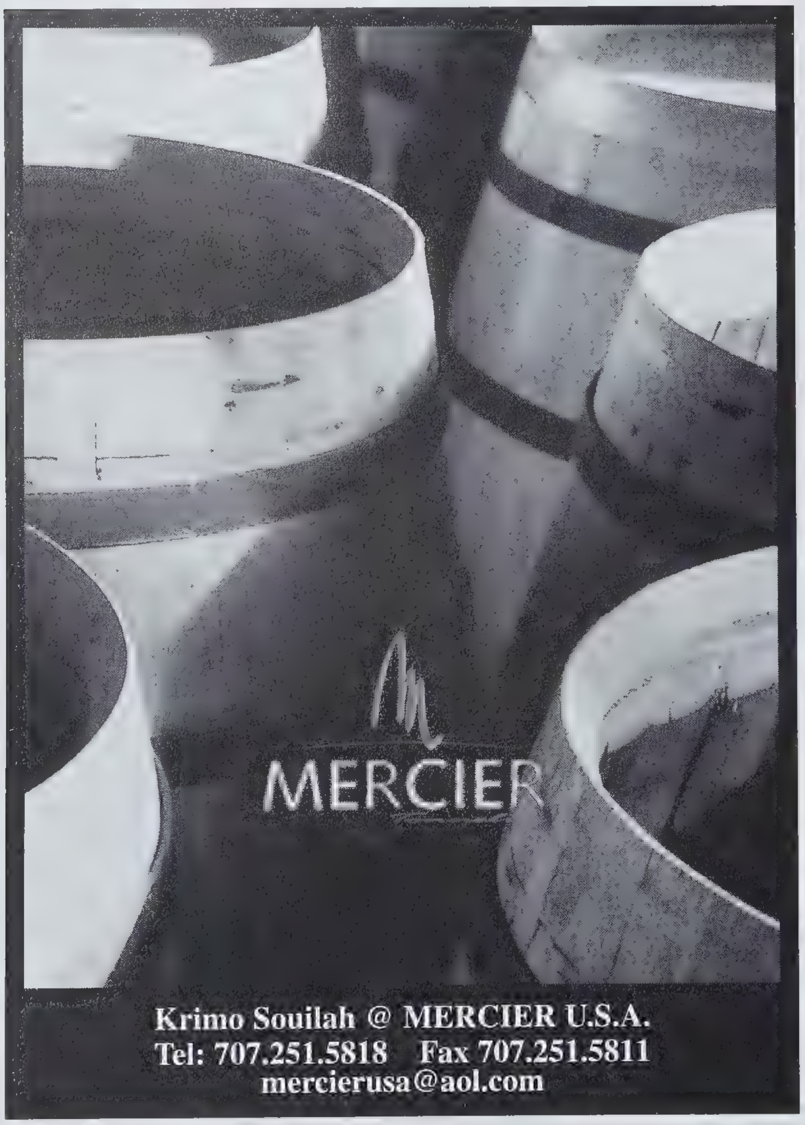
What's more, questions have been raised about how well higher-alcohol table wines will age. California's first high-alcohol Zinfandel, notes Corti, was made in 1968 by Mayacamas Vineyards in Napa Valley. It had 16% alcohol, he recalls. "Today, it tastes terrible."

Corti's decision applies to all table wines with more than 14.5% alcohol, not just Zinfandel. "We will not taste them. If we don't taste, we don't buy," Corti says.

Winemakers have long looked upon Corti Brothers as a choice outlet for their wines. Once a month or so, Corti and his crew taste through more than 100 wines that winemakers have sent or wine sales representatives have delivered to the store in hopes they will pass muster and be added to the market's shelves.

Corti will continue to sell any wines he already has even if they contain more than 14.5% alcohol. However, "once they're gone, they're gone," he says.

Corti, it turns out, is not the first wine merchant to take a position on the increasingly high alcohol level in table wines. Earlier this year, *Decanter* magazine reported that representatives of the United Kingdom



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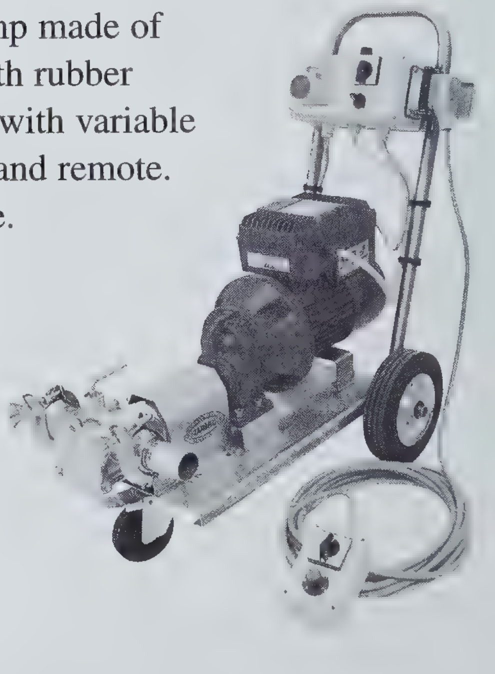

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supermarket chain Marks & Spencer, sensing consumer backlash against table wines with more alcohol than traditionally found in the genre, announced that it would start stocking more wines with 12% rather than 14% alcohol.

I think that this whole issue of high-alcohol wines is just starting to warm up — Mike Dunne, Food & Wine Editor, *Sacramento Bee,* Sacramento, CA.

***PWV** invites readers to submit comments by e-mail to: editor@practicalwinery.com or Fax to: 415/492-9325.*

## FREE RUN response:

I am fortunate to have continuously produced Zinfandel from Amador County for 34 years. Zinfandel grapes ripen unevenly, requiring longer hang time on the vine to achieve a higher maturity point than other grape varieties. Pick too early, you have a "green," sometimes high alcohol wine. If you pick too late, your wine can be more like prune-flavored port.

Amador County is special because, even at higher alcohol levels, the vineyards produce wines at a low pH. Low pH translates to more balanced and flavorful wine.

There is charm to be found in both types of Zinfandel. Darrell Corti is tired of the high alcohol style, while Robert Parker still enjoys alcohol levels of 15% and above. I refer to these higher alcohol wines as "walk around wines," a term coined by wine writer, Dan Berger. While simply socializing with a glass of wine — maybe smoking a cigar — these wines are great.

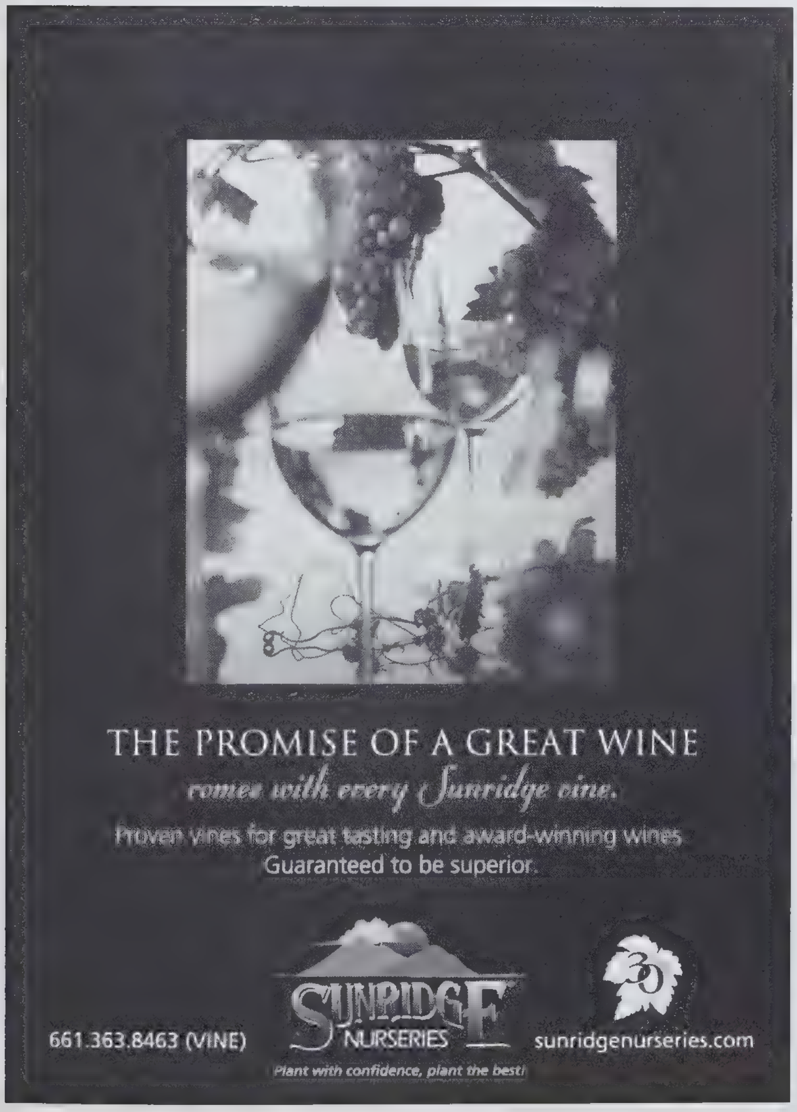
As a veteran professional wine judge, I know that these types of wines show well when you are evaluating more than 100 wines per day. Therefore they often receive higher scores and more gold medals than the more delicate, and often more complex wines with lower alcohol and pH. Often overlooked, these lower alcohol wines, not so "in your face," are crafted to enjoy with food and to refresh the palate.

Today, my focus is balancing lower alcohol and pH to create wine perfectly matched to enjoy with a juicy steak. If the wine in your glass is too high in alcohol and pH, it will overwhelm your food and your palate. Your first bites of steak will taste great, but the fats build up in your mouth, as there is no refreshment in your wine. Your palate is dulled, and your food has lost its bright flavor.

A well-balanced Zinfandel from Amador County with the parameters of 13.8% to 14.8% alcohol and a pH around 3.55 has enough acidity to wash the fats out of your mouth. The alcohol does not overpower the meal, and the pH makes each bite of steak taste like the first.

I produce both styles of Zinfandel. My new releases of reserve wines feature a scale on the back label to inform the customer about which type they are buying. I guess my friend Darrell Corti may be selling at least one of my Zinfandels. I appreciate his frustration.

***Scott Harvey***
Winemaker
Scott Harvey Wines,
St. Helena, CA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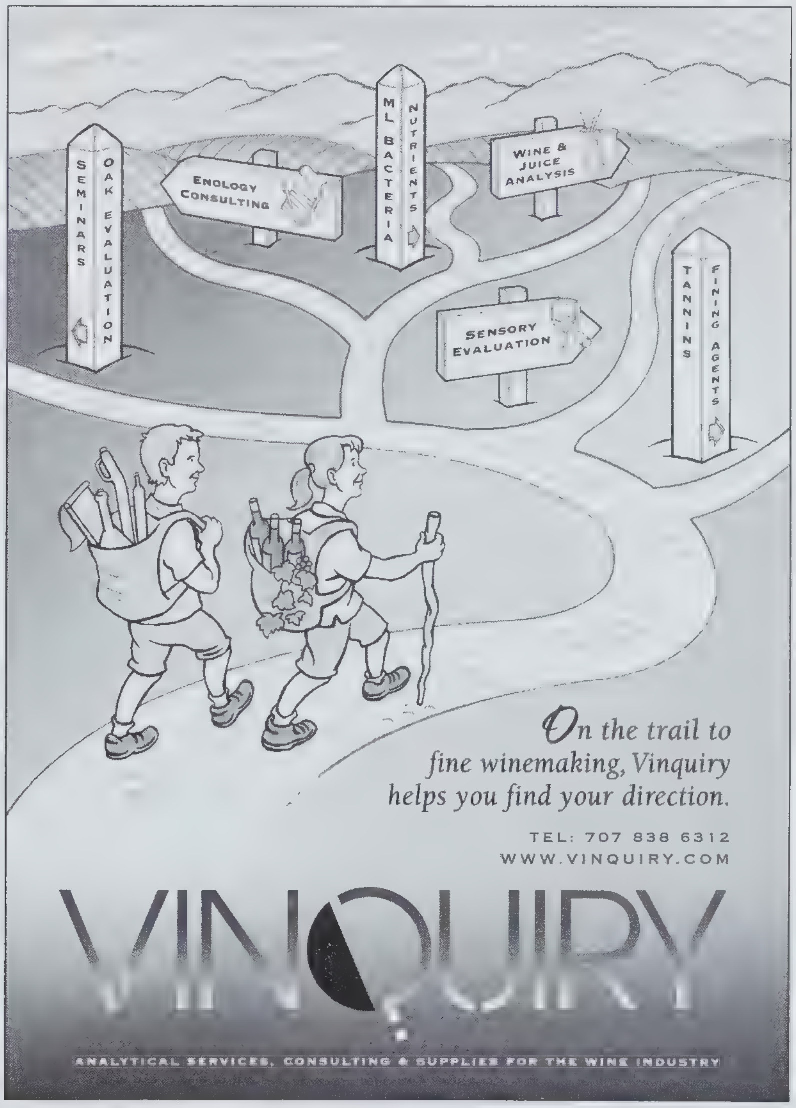

## CONFESSIONS OF A WINE WRITER

# Men I have known

**BY Janice Fuhrman**

The average American wine writer, though there is nothing average about him, is male and over 50. He is partial to muscular, unctuous red wines, and he thinks most white wines are "sissy" or "girly" wines. Don't even talk to him about rosés.

He's amiable when you rub elbows with him at a tasting or a luncheon or if you share a bus trip through a foreign wine region, and he's always quick to tell you his opinions.

I once traveled to South America with a group of wine professionals, among them a well-known and experienced wine writer and his son, a wine retailer. While returning to our hotel from a long tasting and lunch, father said to son, "Everyone's entitled to his own opinion, but only mine is right!" Father and son had a good chuckle.

Are women wine writers different from the men's club? At tastings with winemakers, we tend to be less engaged in a dialogue with the winemaker about how to improve his/her wines and more intent on experiencing the wine itself, recording our impressions and asking questions. "You call theez vine?" spat one elderly German writer I recently traveled with through Italy, thoroughly embarrassing every woman in the room (me, myself, and I).

Most female wine writers urge readers to follow their own tastes a little more and wine scores a little less, and most of us insist on our opinions a little less. But we still write about wines tasting of "tobacco," "floral notes," or "melon." We even describe wines as "pretty" or "sexy," or "voluptuous" and recommend the same wines for the same seasons year after year (rosé for springtime and summer picnics, Zinfandel at the Thanksgiving table, etc.). The "Men Over 50" club established the rules, and even young women writers aren't breaking them much — yet.

But there is great opportunity for women writers to appeal more to women readers: Females make up the majority of wine buyers at the retail level. About 55% to 65% of wines under $40 are purchased by women. Women writers can speak more directly to what women drinkers, cooks, party-planners, and party-

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givers are interested in such as elegant wines that go well with food rather than blockbuster wines that overpower food and go better with a cigar than a meal.

Wine is not just a "guy" thing. In the last decade in California, a handful of women have become some of the "hottest" winemakers in the business, paving a less bumpy way for generations of women winemakers yet to be. These "wine goddesses" craft luxury wines that attract cult audiences and big salaries, and to a great degree, they call their own shots, deftly mixing motherhood with high-profile careers.

There are women winery executives, well-known vintners, and wine educators. (Have you heard the one about the Napa wine educator who started dating a cute guy whose favorite wine was White Zinfandel? Because "Bob" was appealing in other ways, the lady didn't give up on him. On dinner dates with "Bob," she took care to order something sweet or hot and spicy, so the wine would taste drier. That way she could still go out with "Bob" and work on him, until in a few months, he'd be knocking back Cabs and Pinots with her in front of a romantic fire).

For whatever the future may hold, the world of wine writing, winemaking, and collecting is still ruled by men. One of their precepts is that the sophisticated consumer must recognize and esteem complexity in wine.

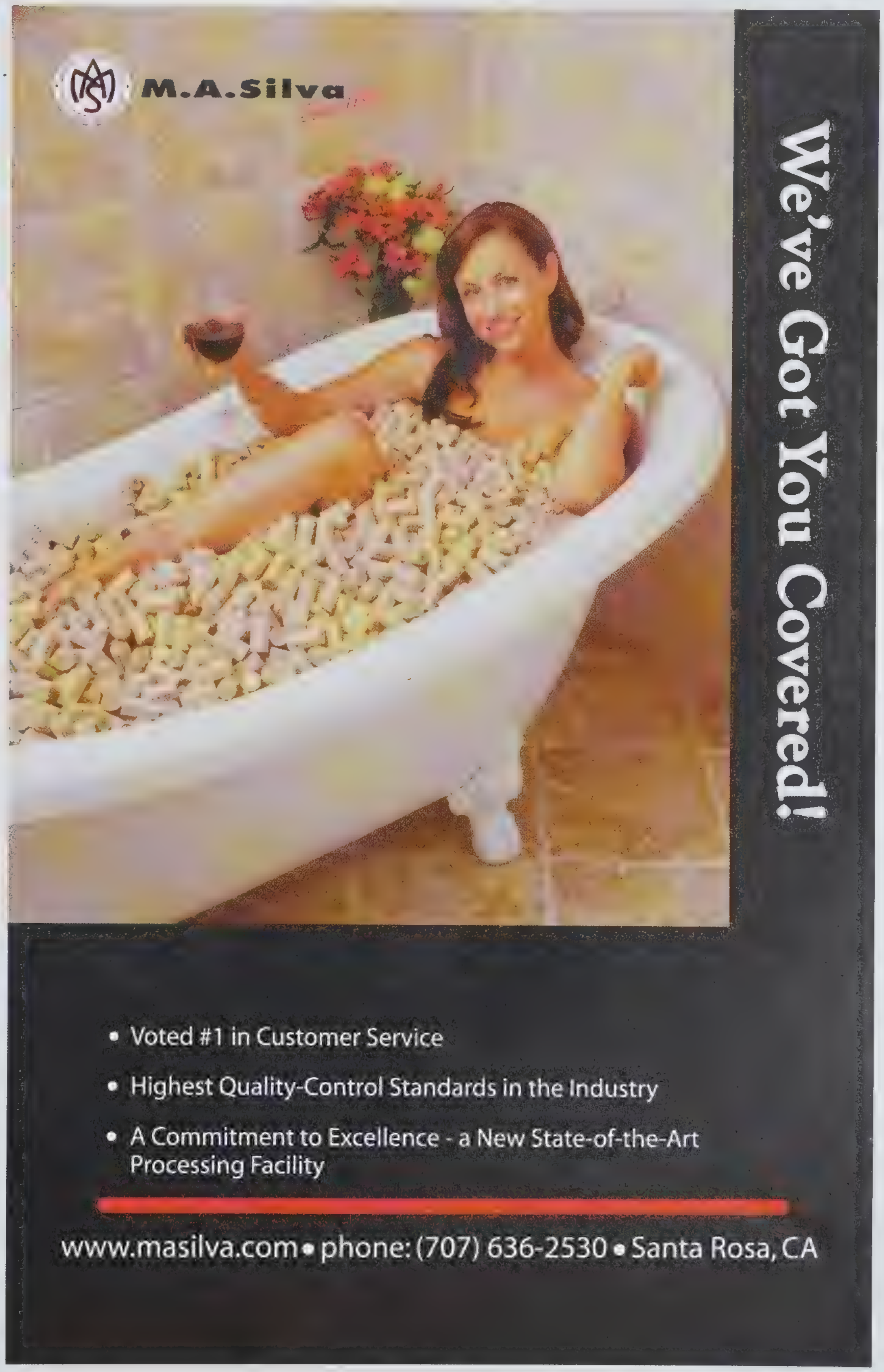
If a wine is simple, it is plonk, they contend. But if it is complex, revealing layer upon layer of flavor — menthol, tobacco, or espresso — as it coats your tongue and the inside of your mouth leaving a lingering sensation in the mouth and throat long after you have swallowed it, then it is a superior wine.

But here's a female point of view: I believe it's often preferable to avoid complexity in both wine *and* men. Sometimes, the simpler the better. Sometimes, all you want is a thirst-quenching, refreshing drink that lifts your spirits and adds a twinkle to your eye.

Give me a simple Italian Trebbiano, then, or a crisp California Sauvignon Blanc and hold the "lovely aromas of sweet red and black fruits revealing admirable depth to its blackberry, cherry, and *garrigue* flavors with copious amounts of ripe tannin."

Sometimes all a woman wants is a surfer or a motorcycle dude who'll zip her off to the beach, whose free spirit and zest for life will uplift her. Forget the argumentative lawyer who'll bog her down in nitpicky details (is it cigar box or pipe tobacco? espresso or macchiato? Number 2 pencil or Number 3?).

After all, isn't life intricate enough for most of us without always injecting complexity into our beverages? ■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PERSONNEL POINT OF VIEW *by Jay Manriquez*

# Are your employees engaged? Your success depends on it!

Is employee disengagement threatening your business? According to a disturbing article in the April 2007 issue of Training & Development magazine, "Employee Disengagement Strikes Early," by Michael Laff, there are compelling reasons to examine whether your employees are engaged or disengaged. Why?

Perhaps you're making a profit and you have seasoned employees who've been with your organization for some time now. You may even have a loyal customer base that ensures a decent month of sales. The situation seems under control. Or is it? If you don't know for sure whether your employees are feeling engaged, now is the time to find out. Here are two good reasons why:

**REASON ONE:** A whopping 43% of employees feel disengaged by their third year of employment! Laff reports that "employee disengagement is a real concern for employers and can occur as quickly as six months after an employee starts a new job." Reasons cited for disengagement include inadequate training and unfair compensation. Other reports cite employees not committed to the company's mission or understanding how to achieve it.

**REASON TWO:** Your bottom-line may take a direct hit. In a report published by the SHRM Foundation, Robert J. Vance, Ph.D. says construction-equipment manufacturer Caterpillar directly links employee engagement with achieving a "$2 million increase in profit and a 34% increase in highly satisfied customers."

The Molson Coors Brewing Company reported "engaged employees were five times less likely than non-engaged employees to have a safety incident and seven times less likely to have a lost-time safety incident."

When former General Electric CEO Jack Welch identifies the three best measures for gauging an organization's health, the first item on his list is employee engagement. Customer satisfaction comes in second, and "free cash flow" is third. Why is employee engagement first? Engaged employees are committed to their work and the organizations that they work in. The result is higher productivity and lower turnover.

What exactly is employee engagement? Here are a few definitions from well-known organizations that get the point across:

- "The extent of employees' commitment, work effort, and desire to stay in an organization" (Caterpillar)
- "...win over the minds and the hearts of employees in ways that lead to extraordinary effort." (Dell Inc.)
- "...the state of emotional and intellectual commitment to an organization...fulfilling promises to customers...improve business results." (Hewitt Associates)

Engaging your employees paves the way for creating stellar gains in productivity and customer service, which directly links to customer satisfaction and a healthy bottom-line.

How would your winery perform if all of your employees were fully engaged in their jobs and in the success of the organization?

Imagine a tasting room staffed with employees who are truly committed to creating a delightfully memorable experience for every customer, ensuring that each one takes away not only wine, but also the unique spirit of your winery. What could such a team generate in customer loyalty and ongoing sales?

Imagine a cellar crew steeped in pride for their safety record and the impeccable cleanliness of their operation.

### How to engage employees

The book *Employee Engagement and Commitment*, a guide to understanding, measuring and increasing engagement in your organization (Vance 2006), identifies several themes that are associated with engaged employees:

- Understand the link between their job and the organization's mission,
- Have prospects for future growth with employer,
- Have opportunities to perform well at challenging work,
- Receive recognition and positive feedback for one's contributions,
- Receive personal support from one's supervisor,
- Enjoy job satisfaction,
- Take pride in their employer,
- Enjoy satisfaction with employer,
- Intend to stay with their employer.

Examining these themes can provide a foundation for enhancing the engagement of your employees. Ask yourself whether you're doing all you can to make progress in these areas. Take a look at the practices that you have in place to help your employees understand how their jobs contribute to the success of the organization. Evaluate your efforts to ensure that employees feel valued, challenged, and supported in their work.

Before you take action to develop or implement a program to engage employees, it would be a good idea to see what your employees think. As Jack Welch recommends, "You need to take a measure of employee engagement at least once each year through an anonymous Employee Feedback Survey in which people feel completely safe to speak their minds."

Your employees' feedback will enable you to take a holistic approach to improving employee engagement within your workforce. This may require a cultural shift in your organization. Survey feedback also may result in making changes to your practices in recruiting, employee selection, training and development, compensation, and performance management. Fine-tuning these practices will build a sturdy foundation for employee engagement.

Seems like a lot of work! It is and well worth the effort. Consider this, the "2007 WorkCanada Survey Report on Driving Employee Engagement to Improve Financial Performance finds that worker expectations are rising... [employees] are looking for greater involvement in and understanding of the companies for which they work."

Additionally, firms' "successes are more dependent than ever on their ability to be willing to change and to comprehend that factors that engage their workers." (*ASTD Buzznews* 4/16/07). Yes, it's more than worth the effort — your success depends on it. ■

*Jay Manriquez is an Associate with The Personnel Perspective, a human resources consulting, training, and recruiting firm in Santa Rosa, CA. Jay has over 23 years of management experience with a focus in human resources, quality, and organizational development. You can contact him at 707/576-7653.*

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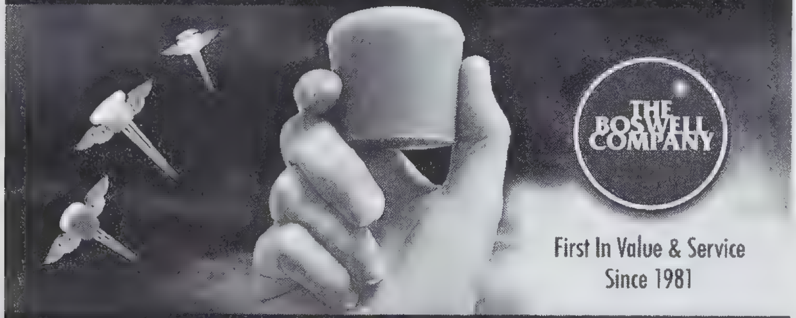

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SMART VITICULTURE *by Dr. Richard Smart*

# Unilateral cordons make vine training easy

I have long promised a column presenting my opinion about the advantages and disadvantages of unilateral cordons. I am often asked about this, especially in California, where the use of bilateral cordons is so common that one would think it compulsory.

### Must vines be symmetrical?

Many growers suspect that vines must inherently be symmetrical. While this thought may be compelling when all one sees are bilateral cordons, nothing could be further from the truth. Bear in mind that our grapevines evolved as forest dwellers. They can still be seen in many forests of America, either as Vitis californica in the west or as a multiplicity of other native species in the east and southeast. Close perusal shows that, when left to grow free without man's intervention, these vines have nothing symmetrical about their growth. So my friends, worry not.

### Which is best, uni- or bilateral?

In truth, there is little difference between the unilateral and bilateral training systems, so the question of which is best is largely irrelevant, despite much conventional wisdom to the contrary. However, there can be some economic advantages to unilateral training when used in combination with what I might term "Smart" vine training.

Some growers think that there is a maximum length that cordons should be trained, for the sake of the vine's health. For many, this is a reason not to use unilateral cordons, as the cordon will be "too long." I think that this concept is entirely fallacious. Think of a native vine happily growing to the top of forest trees, where individual trunks (read cordons) may be hundreds of feet long. This is not an issue affecting vine health or performance, so once again, do not worry.

I have seen several vines trained with long cordons in experimental vineyard systems. The late Professor Nelson Shaulis trained a Concord vine with a cordon of around 150 feet (as I recall) at his Fredonia laboratory in upstate New York. He continued to push out vines and to extend the cordon down the row. In the experimental vineyard that I conducted at Rukuhia, New Zealand, I trained Chardonnay vines with 25 foot-long cordons. They produced at the same rate as cordons of regular length, no difference.

There was one instance where I saw a problem with long cordons. We used long cordons with Cabernet Sauvignon in a research project in Hawkes' Bay, New Zealand. My technician Peter Woods told me that the shoots were "dying back from the ends." Certainly there was a big variation in shoot length. In the spring, growing shoots were over two feet long near the trunk, and only a few inches long at the cordon-end. Mystified, I looked closer and found that the cordons were being choked by over zealous wrapping around the fruiting wire. This is a common practice in Australia and New Zealand, but – not so in California, where young cordons are taped on top of the wire. Wrapping them tightly, with say three turns per foot, is a disaster as the vine grows and cordons thicken. They literally choke themselves against the wire.

### Vine training and cordon length

Unilateral cordons come into their own economically in the training of young vines. But here again, I will run into some deeply held beliefs about cropping of young vines. Brave souls can read on.

When planting a one-year-old dormant grafted vine, the Smart training method is very simple. Install, at a minimum, the fruiting wire and the uppermost foliage wire. Prune the dormant vine to two buds, and then, when shoots are four inches long, thin back to one shoot. Train the shoot to a vertical training string from the ground to the top fruiting wire above the young vine, normally a height of more than 5½ feet. During the season you will need two to three passes to tape the shoot to the string, but you will find it essentially self-supporting using tendrils. Any lateral growth on the stem can have the tips removed.

Provided you planted early, irrigated, and fertilized well, and kept the vines weed-free, you will find that the vine will climb to the top of the wire, then droop down, even in cool climates. Stop irrigating in September, so shoot growth stops, and then the shoot will turn woody.

At winter pruning, train the vine to a unilateral cordon on the fruiting wire. Prune to no less than pencil thickness and to a maximum of 20 buds on the wire, depending on diameter. **Very weak canes, with less than two feet of growth, only need to be cut back to two buds in winter.**

### Benefits of early cropping

Conventional wisdom says to remove fruit from second-leaf vines. I agree, but my timing differs. I suggest that you harvest the fruit **when it is ripe and not earlier**, and depending on vine vigor, the yield can be one to four tons per acre.

Traditional belief contends that young vines will be overcropped if you do this. But as long as the shoots grow strongly through flowering and fruit set, you don't need to worry. If growth slows, remove about one bunch per shoot, and shoot growth will recover. It is important to grow as many leaves as possible on a first and second leaf vine.

Some enologists may say that young vines do not make good wine. This is, of course, absolute nonsense and the contrary is probably true. Smile at those enologists who might criticize you, pull their leg by telling them that **you planted your vineyard with buds taken from very old vines,** so all will be well! (Perhaps some will not realize that you are pulling their leg!)

Normally, in the second pruning season, you can extend the unilateral cordon to fill the remaining space between vines, so you will be into 100% cropping in the third leaf. Those of you who grow grapes for profit will understand how such a training regime impacts vineyard profitability. Early cropping is very important for good returns!

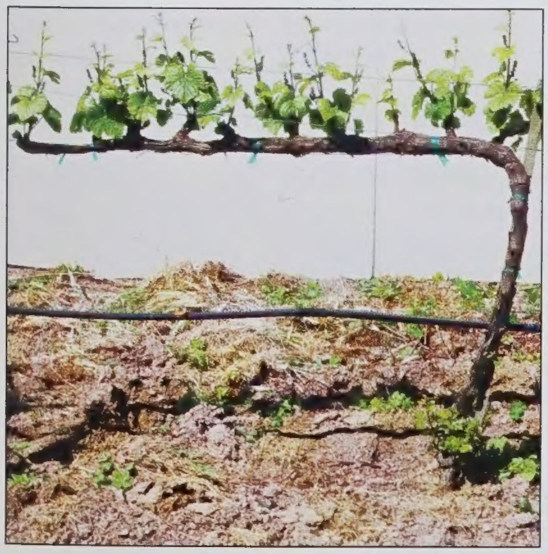
I recall the considerable disservice done to growers by one Californian academic who suggested that both the second-leaf and third-leaf crops be discarded before ripening for the sake of vine health!

Compare the Smart approach to the conventional approach to bilateral vine training. Bilateral training requires pruning back to two buds in year-two and taking several passes through the vineyard to head the vines and form two cordons with a limited crop in year-three. This method requires more labor and gives no year-two crop. It produces a small crop in the third leaf, and finally, if you are lucky, a full crop in year-four.

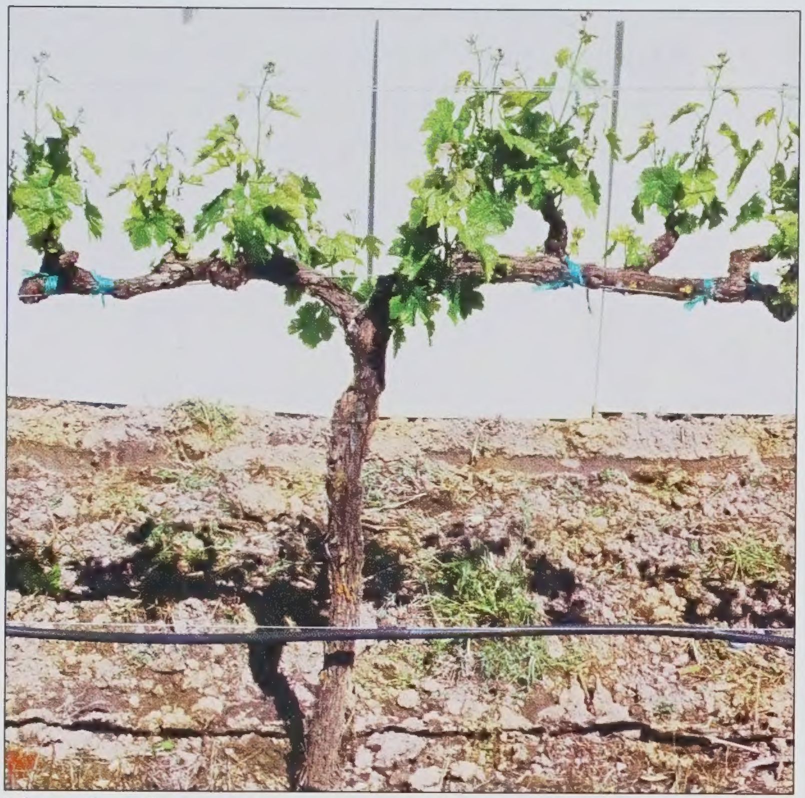
### Conclusion

In reality, whether you use uni- or bilateral cordons will not matter much in the long run, but if you want to make good money from the vineyard early, train the "Smart way" and go unilateral! ■

*Dr. Richard Smart, "the flying vine-doctor," is an international viticultural consultant based in Launceston, Tasmania, in Australia. He can be contacted by e-mail: vinedoctor@compuserve.com. Read about Dr. Smart's business, including his consulting schedule, educational wine tours, and seminars, at his home page http://www.smartvit.com.au. He visits America frequently and his consulting schedule is arranged by Vinquiry in Windsor, CA, tel: 707/ 838-6312 and http://www.vinquiry.com.*



**Unilateral cordon.**



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